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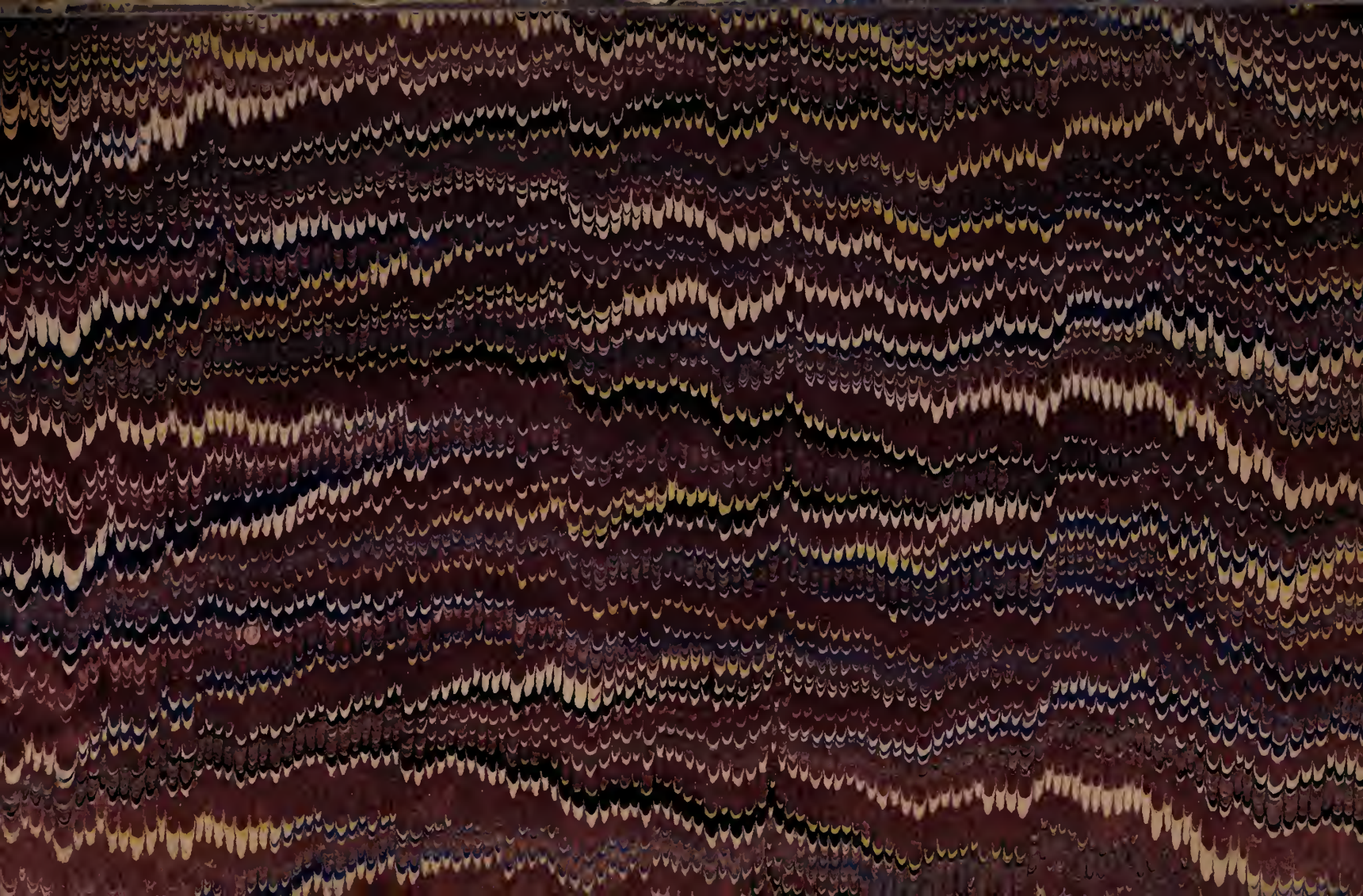

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CONSCIOUSNESS AND PERSONALITY.

CONSCIOUSNESS and knowledge are coextensive, and each implies the other. We are conscious of all that we know, and we know all of which we are conscious. Yet consciousness denotes an essential attribute, or rather the one essential condition of knowledge, of which it is, therefore, a definition, and not a mere synonym. *Con*sciousness means *knowledge with;* that is, dualistic knowledge. Now, all knowledge is dualistic. *Ap*prehension, the taking hold of a single object, teaches us nothing. We learn the nature of an object only by *com*prehending it, by taking hold of it along with something else. Every item of knowledge is the result of a judgment, and a judgment is always a *com*parison; that is, a determination of the likeness or unlikeness of two things. I know just as many properties, uses, or adaptations of an object as I have made comparisons of it with other objects. Some of these comparisons may seem to be not with objects, but with standards or measures; but a standard teaches me nothing of itself: it barely enables me to make my comparison with an ideal instead of an actual object. Thus I ascertain that an object is two yards long, or that it weighs six pounds; but I might as well have x yards or x pounds, did I not have a distinct or approximate knowledge of the yard or the pound in its relations to the commodity measured or weighed. In like manner, if the standard be a quality, the comparison teaches me nothing unless I am acquainted with objects possessed of that quality, with which I can compare the object in question and determine its likeness or unlikeness to them. The same law, the same necessity, appertains to self-knowledge. There is no self-science that is not in its every aspect, element, and detail self-*con*science or self-consciousness.

We can conceive of knowledge—that is, of consciousness—as existing without self-consciousness. We can conceive even of an omniscient self that should have no knowledge of its own selfhood. Suppose a being with the cognitive powers perfectly developed, we will say physically not unlike man, but changeless and motionless, in a changeless and motionless universe, needing neither nourishment nor rest. Suppose him, like those emblematic figures of the prophet's vision, full of eyes before and behind, and with a keenness of sight that could penetrate the remotest depths of ether; with ears, too, that could take in every note on the scale of nature's unceasing yet unvarying harmony; and with an intuitive perception of proportions and correspondences, so that the entire immutable cosmos is as well known to him as to us is the fashion of our garments or the furniture of our apartments. He could have no sense of his own distinct selfhood, no conception of the *me* or the *not-me*. Uranus or Sirius would be to him in no other relation than his own arm or foot. He could have no conception of being, because there would be nothing that could suggest the idea of not-being.

Vary the supposition. Imagine the universe not changeless, tho our supposed spectator of it is changeless. There is constant development around him. In the far-off empyrean he sees nebulæ crystallize into solid orbs; in his own near neighborhood trees grow, blossom, bear fruit, and ripen it; the once tenantless woods and waters are peopled; still in him the life-currents are congealed: there is in him this clear, all-penetrating, all-comprehensive perception, without the slightest modification of his status. He could not know that all this development was not self-growth. He would still be utterly incapable of circumscribing his own selfhood. He must move, he must detach himself from his environments; he must separate himself from the immovable or the developing universe around him; he must be able to compare the *me* with the *not-me*, that which obeys his will spontaneously with that which awaits some express action upon it to overcome its inertia,—in order to know that he is not the universe.

Pantheism is identical with this hypothesis. It postulates an *anima mundi*, a soul of the universe, not independent of mat-

ter, but in it and of it. It is under a necessity of development not contingent on its own volition. From its chaos, by inevitable destiny, must be evolved worlds, suns, systems,—all forms of order, life, beauty. But it can obtain, so to speak, no outside view of itself. It therefore knows itself only in detail, not in the mass. There is intelligence in every star, in every leaf; but it is an intelligence diffused, not concentrated. There is nothing outside of it; it has no *not-me*, and therefore no self-conscious *me*. Not until in the order of development man comes upon the stage is there any being in the universe that knows a *not-me*, and thus can conceive and define the *me*. Therefore is it that with equal logical consistency and psychical absurdity, in the conventional pantheistic *patois*, God is said first to attain self-consciousness in man.

Self-consciousness implies not only a detached and separate existence, but a continuity of conscious being. We can conceive of cognitive power in a being detached from other beings and objects, in a mutable universe, yet having cognizance of the present moment only, with no retentive hold on the past, and such a being, tho conscious of successive impressions, could have no consciousness of selfhood. This, undoubtedly, is for a brief transition period the case with the human infant. The child is at first probably unaware of his own being as separate from his surroundings, yet only for a little while. For a longer period he seems wholly unaffected by the past, even by the very recent past. Thus the lancing of a swollen gum will instantaneously chase from an infant countenance the expression of agonizing pain and restore the full capacity of mirthfulness. Such is undoubtedly the case with the lower animals, and in some measure with the higher also; for, tho with them wonted sights and sounds renew old impressions, it may be doubted whether, apart from such impressions, they ever show in the present any tokens of a remembered past. Certain it is that severe and protracted suffering seems entirely forgotten by them the moment it has ceased.

We attain distinct self-consciousness only by comparison of the present with the past; that is, by our experience of the succession of perceptions, impressions, ideas. I receive a certain impression from without at this moment; another impression

the next moment. I compare the two. I become aware of their difference; of their utter unlikeness, it may be. Yet they are in close juxtaposition. I cannot put them apart from each other, unlike as they are. There is an identity along with the difference. But this identity is not external, not in the objects perceived or in our ideas of them, not—to use the trite term—objective. The identity must, then, be in that which perceives, —that on which the successive impressions are made. In fine, time and selfhood enter simultaneously into the realm of concepts. An unchanging being in an unchanging universe would mark no lapse of time. Phenomena succeeding one another mark and render cognizable successive moments of time, and by their presence at the same moment to the mind of the observer reveal to him the continuity of his own being,—the identity of his past self with his present self.

But what is this self,—this swimmer along the stream of time, which retains its identity while on the banks of the stream objects are constantly flitting out of sight and fresh vistas opening every moment? The identity does not reside in the perceptive organs or in the recipient organism of sensation. Some thirty years ago I visited the Mammoth Cave. The more remarkable of the chambers in that cave are as distinctly present to my consciousness at this moment as are the writing materials now immediately before me, and had I any skill in the use of the pencil I could represent those chambers as accurately as I could copy a page of my own writing. Where are they? They certainly are not painted on the retina of my eye. They have left no traces that can be discovered in or on any part of my organism. Were my body dissected and every portion of it examined with a microscope of the highest magnifying power, no vestiges of them could be found. My brain, indeed, was active when I saw them, and was, I doubt not, the medium of those rare and strange sensations; but I have no proof that there was any permanent modification of the brain by what I then saw. I am perfectly aware that this is the received hypothesis among physicists; nor do I care to deny it. But it is wholly unproved. The dissection of the brain has never revealed any tablet notched or scored with sensations. Nothing appears under the scalpel to discriminate in this respect the oldest brain

from the youngest. Nor is it easily conceivable that forms and colors could remain fresh so long on a tablet upon which innumerable records are made every day. Nor yet can it be physically the same brain that it was. Yet here are the sensations of thirty years ago and those of to-day, simultaneous, or alternating so rapidly as to seem simultaneous, equally vivid, equally realistic, to my consciousness; while there is probably not a particle of matter in my brain or in my whole body that was there thirty years ago.

In behalf of the physical theory of memory, and therefore of identity, we are reminded of the persistency of scars and wound-marks notwithstanding the change of particles in the body. The analogy would be more pertinent, did the pain or soreness remain where the scar is, or could it be recalled at will. There is, however, no greater improbability in the alleged multitudinous records on the brain than in the numbers vast beyond conception which we take with undoubting trust as representing the phenomena of optics and acoustics. But admitting that every impression has left some physical token of itself in the fabric of the brain, we must still look outside of the brain for the causes of what is constantly taking place with reference to those impressions. Physically they would be fresh and vivid if new and strong, vivid tho not new if originally strong; but if they were faint and feeble at the first, and overlaid and worn smooth by the records of many intervening years, during which it is admitted that the brain must have become a palimpsest, how is it that those which were, when made, by no means intense are restored so often with a distinctness, minuteness, and pictorial accuracy which could not be surpassed were the scenes immediately before us? These impressions, so far as they are physical, must of necessity be subject to physical laws; but the familiar facts of memory and recollection run counter to any physical theory that can be devised. Even if we admit that the laws of association work by a material process, reaching more remote by the medium of nearer impressions, and sending a quickening thrill from some record of yesterday to one of long by-gone years, still the laws of association are not themselves physical; they connect objects and events that have nothing material in common; they vary very widely among persons to

whom there is no physical reason why they should not be common and identical.

In fine, whatever part physical laws may play in the continuity of life to which memory bears testimony, I am constrained to recognize a selfhood distinct from and independent of my bodily organism. If it be in my body that things old and new exist simultaneously, the recognition of their simultaneous existence is not in or by the body. I cannot call my body *me*. It is mine; it has done work, and good work, for me; it has made accumulations for my benefit; and, for aught that I know to the contrary, it may for its lifetime keep faithful tally of all that I have ever learned or known. Yet I cannot conceive of these accumulations as having themselves a material form. The most that the brain can have is their signs, and not themselves. I can conceive of my retaining all that is in what I call my mind, tho I lose my body,—of transporting it into another and very different organism.

Indeed, I find it much easier to question and doubt the commonly received facts connected with the organs of sense than to deny the reality of a supersensual consciousness. If what I saw thirty years ago is to me as if it were seen at this moment, while yet my senses are not in any form or way taking cognizance of it; if what, in the hackneyed phrase, I see with the mind's eye I to all intents and purposes see as clearly as if it were painted on the retina of the bodily eye,—how know I that vision is a bodily function; that the eye ever sees; that what we call the organs of sense are the proximate causes of sensation and of the resultant impressions? If there is a self which sees and hears things entirely beyond the reach and out of the scope of those organs, may it not be the very same self that sees and hears things within their reach and scope? May not eye and ear be mere loop-holes in the prison-walls, through which a self that would have no need of them were it outside of the walls is now wont to look out and to listen? Does not the very use made of these loop-holes indicate a capacity which in no sense belongs to them? Their structure implies a looker or listener other than themselves. They may be in perfect order, and may have sights and sounds within their range, yet without any resulting sensation or impression. Nay, it may be sights and sounds

more intensely real to the selfhood than the surrounding world is, that make eye and ear impervious. I may see so vividly the faces of the long dead that the living shall cross my field of vision without making any impression on my brain. I may hear voices that left their last earthly echo many years ago with such distinctness, and with such engrossing interest, that the utterances of a by-stander shall not reach me. In such cases the nerves of sight and hearing either are or are not affected by the objects physically present. In the former alternative, a self independent of them is needed in order to command their service and to render it availing; in the latter, they need the volition or consent of that independent self as a condition precedent to their exercise.

We thus see that self-consciousness is not the consciousness of the body or of its organism, but of an entity which owns the body and uses it, and which can also suspend the use of the body without suspending its own activity. This, I contend, would be the spontaneous result of self-reflection,—the conclusion which developed selfhood, if left unsophisticated, could not fail to reach and to maintain without a question. By this I mean to assert that self-consciousness, unbiassed in its natural development, is spiritualistic. Under whatever culture, the mind sufficiently awake and mature to reflect on itself, to ask itself, What am I? conceives of itself as non-material, as other than the body. Spiritualistic theories are spontaneous. They are prior to materialistic speculations. They are recognized in some fashion in all the earlier philosophies. Materialism is never spontaneous. It is never a natural form or unforced development of self-consciousness. It is the result of reasoning, not of feeling; a scientific hypothesis, not a metaphysical concept. The man who believes himself a mere chemical compound never had a feeling in accordance with that belief. His consciousness repudiates it, and in all probability relucts from it even with loathing. But it is needed to make his physico-chemical theory of life and its evolution coherent and complete, and to this scientific necessity he surrenders convictions which he cannot evade, and negatives a testimony of his own being which he cannot silence.

Setting aside the divisions in scientific treatises, we may not

unfitly class the contents of self-consciousness under the several heads of experience, character, and purpose; experience bearing a large part in the shaping of character, and character finding its most genuine outcome and expression in purpose. Under the title of experience we must comprehend knowledge of all kinds, which becomes knowledge only by virtue of experience in the literal sense of the word,—by trial; for, as I said at the outset, we know only what we have tried or tested by some object previously known, or by some standard representing a kind or class of objects. Every *notion* or item of knowledge is the outcome of comparison or judgment. It is these notions or completed judgments of which we are conscious; not of the objects themselves, but of the action of our own minds with reference to them. The continuity of the selfhood makes past judgments virtually present, so that the actual self-consciousness of each passing moment comprehends large sections of the experience of a lifetime.

Clearly distinguishable from the consciousness of knowledge is that of character. Knowledge, while subjective, may be virtually objective. Experience, even such as seems most intimately subjective, may remain thus objective. There may be no relation of resemblance between what I know or experience and what I am. Indeed, in no respect do human beings differ from one another more widely than as to the absorbent power or tendency, whether for good or evil: some soaking in like a thirsty sponge all that they know or experience; others, like an oiled garment, impervious even to a continuous immersion in an uncongenial medium. But, however this may be, what they are is to all developed minds in a greater or less degree a part of consciousness,—a consciousness which is the result of comparison, of judgment. Self-knowledge implies a knowledge, if not of other men individually, at least of ideal humanity. We may compare ourselves with other men, and may thus learn whether and how far we are like or unlike them; or we may take what we call a trait of character for our standard of comparison, that trait being human, and of necessity representing a class or kind of men, real or imaginary. Thus if I am conscious of being honest, or grave, or frivolous, or crafty, I attain this consciousness by applying the meaning of the term

in question as a measure or standard of self-comparison and self-judgment; and the term is in my own mind not abstract, but concrete, designating a known or imagined class of men pre-eminently possessed of this trait.

If such is the process by which self-knowledge is attained, it follows that we can have no conception of any trait of character except as a human trait; and if a human trait, as belonging really or potentially to men. If there be divine attributes that are not human, we can know nothing of them, nor could any possible revelation make us acquainted with them. If there be alleged divine acts which are called just or merciful, which yet do not accord with our concept of justice or mercy as concrete in man, it is impossible that they should seem to us just or merciful, whatever theological euphemisms we may employ concerning them. On the other hand, of the consciousness—as I believe, not a continuous self-consciousness—of the inferior animals we can neither know nor conceive any trait or attribute that is other than human. Thus, so far as we know anything, if we know anything, of the ferocity of the tiger or the affection of the dog for his master, it is simply of such passions of hatred or love as we are consciously capable of. The beastly part or type of the passion we could not comprehend, tho we were to pass a lifetime in watching its manifestations. Thus in our concepts of character we cannot transcend humanity or fall below it. *Godlike* and *beastly*, as applied to character, are not suprahuman or subterhuman, but the outside limits of humanity,—the asymptotes which the curve of our consciousness may approach perpetually, but can never reach.

While we employ actual men or ideal humanity as the standard of comparison in judging of our own characters, we judge of others by comparing them with ourselves, either directly or by a standard of comparison which is simply our own consciousness idealized and generalized,—for the most part directly, as it seems to me; for in our judgment of other men's characters we are seldom dispassionate. The characters that we approve have our love and our sympathy; those that we blame are the objects of our dislike and aversion; and these emotions indicate a sense of kindred or non-kindred which can hardly have any other

source than the contact of soul with soul without the intervention of any third term as a standard.

The consciousness of character is undoubtedly unceasing, tho often sublatent. I certainly never cease to be conscious of my existence, tho it is very seldom that I say to myself, "I am." When I inwardly say, "I am," there is more than the simple consciousness of being; there is a reflex mental action upon my subjective consciousness which thus for the time I render objective. But whenever I do say, "I am," I say to myself what manner of man I am; I differentiate myself from other men; the reflex consciousness of being is a consciousness of character, and I therefore cannot doubt that the latent or sublatent consciousness of being is equally a consciousness of character.

The consciousness of purpose is intermittent. It seems complex, and might be termed the joint product of experience and character; but it may be more fitly defined as the consciousness of character forced into expression by experience. Purpose is character in action. Its specific form is, indeed, determined by the experience which gives occasion to it; but what we are conscious of at the moment of volition is passions, dispositions, or affections, which exist independently of their occasion, and which on a given occasion would be other than they are, were character other than it is. They alone are subjective; all the other contents of the purpose are objective, and might vary indefinitely without suppressing any previous elements or eliciting any new elements in the subjective consciousness.

Conscience and *consciousness* have derivatively the same meaning. But the Latin *conscientia*, corresponding to both, was seldom used in the larger sense by classical or ancient authors, who almost always employed it to denote the knowledge of one's self as good or bad, or of one's acts as right or wrong. Its Greek synonym, *συνείδησις*, is almost uniformly used in the same limited signification. Descartes was the first writer who employed *conscientia* as a philosophical term in the full sense attached to our word *consciousness*. In language the men of old time always "builded better than they knew," embodied in their forms of speech truths which they felt rather than thought, and stowed away in single words an intuitive wisdom profounder

than their deepest reasoning. In the age-long use of *συνείδησις* and *conscientia* to denote exclusively moral self-knowledge, there was a virtual confession of the pre-eminent worth of this,—a worth so immeasurably paramount as to throw all else that the words might contain into utter insignificance. The transcendent importance of this one department of self-knowledge is not, then, a discovery of modern time, and this early usage as to the words which I have specified is but one among very many tokens of what we may most fittingly term the divine element in language, a designation equally appropriate whether we suppose a special providential shaping of speech, or—what is more probable—a diviner humanity in a golden primitive age when language had its birth than was transmitted to subsequent ages of brass and iron.

We propose now to consider one of the parts, or rather modes, of consciousness which may attach itself equally to experience, character, and purpose; namely, personality, which by no means includes the whole of one's being, still less all that is peculiar to the individual. Personality, indeed, has no part in self-isolation, and excludes that which is wholly one's own,—his *peculium*. Person (*persona*) denotes that through which another sounds or breathes. The organ-pipe may be taken as its analogue. The pipe has in a certain sense its own separate being, but a being utterly inane and worthless except in its relations to the atmosphere, the instrument, and the performer. It derives its whole value from the air breathed into it from without, and from its harmonious relations with other pipes which are similarly *inspired* or breathed into. Let it lie outside of the organ and apart from the other pipes, no matter of how precious material, of how delicate finish, of how elaborate ornamentation, it is worth no more than any reed that might be cut on the river-bank; worth less, indeed, for the schoolboy's breath may wake the air in the reed into some semblance of melody.

The human person, as a person, is the medium of the breath of God, the conductor of his will. So far as he is a person, God speaks and acts through him. His whole personal being is a melody whose strains, inbreathed by God, mount constantly to him in devotion, love, and praise. But melody is not all. It needs harmony for its complement. The true person must be

in accord with all other persons, with all beings in whom is the breath of God. Yet harmony among persons can never be merged in unison; for the Divine Spirit, because infinite, is multiform in its breathings, even as the mass of air forced into the organ strikes for every pipe a note different in pitch and quality from every other,—one breath broken into such waves and ripples of melody as might flow from hundreds of spirit-voices floating on the breeze. Nor does the organ in all its range, from the thunder-tones of its sub-bass to its highest bird-notes, and these multiplied by the score or more of instruments commanded by the several stops, begin to typify the immeasurable diversity of power, proclivity, capacity, and tendency, of traits of character native or acquired, of temperaments, of idiosyncrasies spontaneously developed or created by circumstances, all which may be personated by the inspiration of God and bear their part in the harmony of loyal souls,—a harmony which indeed may seem to the ear that takes in but a small segment of it marred by discords, but in whose grand diapason all discords are blended and reconciled.

Now, there is nothing that rightfully belongs to the selfhood which may not be made a part of the person. There is no endowment that nature gives or education confers through which God may not virtually speak and act, and which may not thus bear its part in the harmony of faithful spirits. We may affirm this even of capacities which are liable to be wasted, and worse than wasted,—of wit and humor; of all the graceful and ornamental parts of deportment and character; of everything appertaining to the æsthetic nature and culture. They may all be God-breathed; and if so, they strike only sympathetic chords in the universal harmony.

But there is a vast amount of the potential material for personality that is not so used. Men are always liable to have and to cherish individualities in themselves harmless, but out of gearing with God and man, neither inspired from heaven nor of service on earth. Men often pride themselves on these individualities as placing them apart, to be wondered at rather than sympathized with. Taste and art, wit and humor, genius and learning, sometimes even grace and refinement, may be made dissociating rather than consociating elements, selfish alike God-

ward and manward. There are brilliant spirits that shine like a fire in a close oven, not like beacon-lights. There are great capacities for which the world is none the happier or the better. Such souls have their parallel, not in the organ-pipes in perfect tune, inspired by the same breath and under the skilled touch that commands its every modulation, but in those same pipes lying here and there on the ground, through which no breath passes, from which no note strikes the ear.

This matter of personality has an important bearing on the continuity of life through and beyond the death-change. All that is truly personal is truly living and has its presage of immortality. It is pervaded by the breath of the eternal God, and there is no reason why it should die while he lives. But what is merely individual and in no sense personal has in it no vital element, no vital relations, connections, or affinities, and there is no reason why it should live.

It is then left by God, not without the certainty of his helping grace in aid of the human will and endeavor, for each man to determine how much of himself shall be immortal. There is nothing worth having but our bodies that we may not take with us in dying; there is nothing but the love of God and of goodness that we may not have to leave behind us. We may lead harmless lives, yet die miserably poor. We may seem poor here for lack of occasion or opportunity, yet may die with untold wealth. It is among the commonplaces—and, like many of them, false, or true only in part—that whatever of knowledge we gain here is a treasure forever. This cannot be admitted without qualification. No kind of knowledge has a permanent worth in itself or for its own sake. This will be readily granted with regard to mere unclassified facts. They are a dead-weight upon the intellect, impede its action, clog its progress, cramp its flight. But are mere facts of any greater value when classified and labelled under the name of science? All that we can say of them is that, thus packed, they are less burdensome. Not so, however, when God speaks to us through them; when they present ever new phases of the supreme Providence; when for impersonal law they give us visions of a beneficent order pervaded by omnipotent and omniscient Love. Such knowledge is personated by the breath of God, and in us it becomes an insep-

arable part of our persons. This is true not only as to science popularly so called, but equally or even more so as to all that appertains to humanity, whether it be the philosophy that takes cognizance of intellect and soul, thought and feeling, right and duty; or the evolution of the infinite Providence in human history; or language, in which, as I have said, it is impossible not to recognize the Divine Word-builder. Moreover, knowledge thus formed, thus attained, is always a generous, loving spirit, in harmony with fellow-spirits, giving all the light it welcomes, apt to teach, thrice blessed in bestowing, deeming itself enriched only when it can make its wealth availing. Such wisdom then has its hold both on God and on man, its essential place in the universal harmony, and thus belongs to the eternity in which man shall dwell with God so long as God shall live.

The like may be said of all that is graceful and beautiful in human culture, of poetry and art, of whatever can add ornament and joy to life. It all has its source and its archetype in the beauty-breathing, joy-giving spirit of the All-Father, and through it his spirit breathes benignity and blessing for all who can admire and enjoy it. When Fra Angelico knelt at his easel, and prayed as he painted, and covered the walls of his cell with transcripts of his heavenly visions, think you that those forms can have faded from his inward eye when his emaciated body returned to dust? Rather lives not still the artist-soul, flooded with the eternal beauty whose faint reflections here filled him with praise and love and glory? And are not those who in the broken harmony of earthly song have led the worship of the ages, and fed the sacred flame in thousands upon thousands of kindred hearts, foremost among those who strike the harps of gold "in the blest kingdoms meet of joy and love"?

Here, too, we may answer the question so often asked, Are the human affections eternal? We might reply equally, Why should they be? and, Why should they not be? Why should they be eternal, if the love has been sordid, selfish, individual, if God has had no part in it, if there has been no divine element in it? George II. of England, if possible more of a brute than the last of the name, mourned most bitterly at the death-bed of his wife, whose love he had shamefully and shamelessly abused, but whose services had been invaluable to him, and in his par-

oxysms of grief there was not an utterance that indicated sympathy or pity, but only an indignant sense of personal loss and wrong. Is there anything in such love that ought to live, that could live? But if love has been unselfish; if it has mounted to God, thence refluent earthward; if it has loved kindred and friends in him, and him in them, why should it die? Why should it not flow on through the years of separation, to be consummated when those who lived together here shall be united in the same apartment of the many-roomed house on high?

In conclusion, our philosophy concurs with Christian faith in postulating a personal immortality; that is, the immortality of whatever in man is God-breathed and is thus brought into harmony with all else that is God-breathed. Consciousness can discriminate without error between what is merely individual and what is truly personal. The personal alone belongs to the God-born, undying soul. All else may perish; that, if it be, will be forever. Can it fail to be in any man? or can it die out before the man seems to die? We know not; but the bare possibility may well blend the voice of philosophy with that of the Divine Teacher and Saviour, "What is a man profited, if he shall gain the whole world and lose his own soul?"

ANDREW P. PEABODY.

THE RELATIONS OF MORAL PHILOSOPHY TO SPECULATION CONCERNING THE ORIGIN OF MAN.

WHOSOEVER forms any careful estimate of the prevailing current of opinion as to the existing order of things in the world must be impressed with the deep and wide influence of the theory of Evolution. The *set* of the current is manifest, tho there is not absolute agreement among scientific men, and there is naturally still greater divergence in the public mind.

The general agreement may be represented as an assent to the position that there has been progress in variation and complexity of organization under the influence of surrounding conditions. Whether this amounts to the appearance of new species in the history of animal life, may occasion considerable controversy. But that manifold deviations in structure have been introduced under the demand which circumstances have occasioned, is not now seriously disputed. And this does not hold merely in a few select cases, which may be taken as fortunate examples, but along the whole range of animal life. This being admitted, it is only a natural accompaniment of this view of evolution of life, that scientific thought should seek to include man under the theory. For, whatever human nature may be in respect of higher attributes, it includes physical life, subject to physical conditions similar to those applicable to lower orders. Human life, contemplated in its physical aspects, presents great varieties in appearance and adaptation to different kinds of work. What are the influences of civilization but so many forms of agency exercising an unobserved but powerful sway over the destinies of man, presenting at last in the history of

families and of nations permanent records of the results accomplished? When the matter is considered in this light, it is plain that no one doubts that the influence of surrounding circumstance does much to modify the physical conformation of individuals and of families. Some of the more humorous aspects appearing amid the lights and shades of social life are recognized in this way. A change from the country to the city is a mere change of situation, but it brings to view a want of adaptation, which by and by vanishes from observation as the result of changes induced by environment. Conversely, a change from the city to the country places family life under the fresh, bright, and stimulating influences of nature, which, alas! remain unknown, or are only occasional and flitting experiences, in the history of other families. The physical results—to speak meanwhile of no other, for these afford the matter of consideration here—are manifest; and as they are recognized by all, we may say that we are all less or more evolutionists in our view of the diversity of physical characteristics appearing among us.

Such concurrence, however, as to the moulding power of outward circumstances, tho it sustains in some degree an evolution theory, goes but a little way towards affording the effective support desired. What has been thus acknowledged is mere variation in physique, and deportment, and expression of countenance, appearing in the history of individuals. And all this is compatible with a thorough-going denial of the theory of Evolution in its essential nature as a theory of the evolution of higher forms of organized existence from those of a lower order. Whenever we have to pronounce upon a theory which suggests that the highest order of physical life is merely a development from a lower, and that also from a still lower, and so on until we have reached germinal forms of microscopic minuteness, there are hosts of questions of great difficulty to be dealt with before we can approach any general conclusion. There are questions of evidence, and questions as to the conditions of legitimate thought, which carry us far adrift upon an ocean of investigation, in comparison with which ordinary courses of observation seem but as a series of pleasure-sails on a smooth and narrow river.

What the Evolution theory offers as the key to the com-

plicated varieties of animal life in the world is the suggestion that in the course of the ages all these have sprung from a very few primordial forms at most. This gives to the theory a breadth of range quite beyond the reach of a single discussion; and makes it needful for critical purposes to narrow to a point of application on which attention may be concentrated. Anything more obviously within the range of ordinary inquiry, or more thoroughly testing for the theory as a whole, we could not have than the question concerning the offered explanation of human nature. And we find at once the most familiar, and scientifically the most searching point in the test, when we concentrate upon the moral nature of man. Distinguishing between right and wrong in conduct, measuring of individuality, and reckoning of individual responsibility as we look back upon the past, are the familiar engagements of every day life, and they present the most marked distinctions of the human family as placed in the midst of manifold orders of animal life. Morals must present the crucial test for an Evolution theory,—and the exact significance of this test may here be presented in outline.

The Evolution theory has now reached a stage where it can afford to depart somewhat from the multitude of interesting and important details as to the contrivances apparent in the organism of insects, birds, and quadrupeds. It must encounter the sterner tests which it has challenged. And as all sciences have their own contribution to offer, Moral Philosophy only shares in a common task when it adduces facts and problems which an Evolution theory must include in order to make good its claim to be regarded as a theory of organized existence. Observations in Natural History and in Physiology are essential for the support of the theory, but insufficient. They may suffice when attention is occupied with a low order of animate existence, but they contribute only a small part of the evidence required when we contemplate the origin of man. Even the most important contributions from the department of Physiology exclude the most perplexing facts in human life bearing on an evolution theory. Physiologists are, indeed, not unnaturally inclined to assume that their science is destined to include the whole facts of human life; but the facts to be adduced

hereafter will show how far we are from being in possession of rational warrant for such expectation.

Equally insufficient for the contemplated purpose are discussions concerning the relative intelligence of the higher animals. This is a region of inquiry which cannot be overlooked, yet cannot be conclusive. That some classes of animals show great intelligence, and that some tribes of men are low in the scale of intelligence, are undoubted facts, and facts of real consequence in the discussion; but they have much less bearing on the question as to the origin of man than seems commonly supposed. In order to show this, it is not needful to insist on the vast chasm between the least intelligent tribes of men and the most intelligent races of animals. It is even more important to observe that we are without any theory of animal intelligence, notwithstanding the wonderful advances of physiological science. Within the area of Physiology we are still wandering deviously in a most perplexing thicket. We find high intelligence in some animals which do not stand high in the scale of organic being; on the other hand, we find the largest and most important nerve-cells in the brain of animals which do not show much intelligence; and, as a natural consequence, science has no theory to offer of the facts of intelligence included within the sphere of comparative physiology.

This being the position of matters for the present, even when we place ourselves implicitly under the guidance of Physiology, it is only what should be expected, if we find in society a strong antipathy to the speculation which asks us to accept the hypothesis that the human race has risen to its present exalted position by a series of slow advances from the low levels of the water-lily or the shell-fish. There is not in the public mind obstinate reluctance to surrender opinions long cherished. There is even a singular willingness to forsake long-accepted theories for the purpose of adopting new, tho unverified suggestions. But there are intellectual conditions which must be in some measure satisfied before a general assent can be obtained for novel theories; and the recognized conditions of belief are peculiarly strained by a theory which suggests that the natural history of human life is to be found by tracing its origin from lower levels in the scale of animate existence.

It is, indeed, suggested, by way of aiding an Evolution theory in its attempts to pass over these barriers, that the opposition encountered is a merely *sentimental* one. There is in this suggestion much truth, but no science. As long as men have their convictions unshaken they must retain the appropriate sentiments. It is, therefore, an argument unfavorable to the intellectual power of the evidence for the Evolution theory of the origin of man, that the sentimental dislike of the theory continues so powerful. There is a *logic* of sentiment; and those who would attempt to overthrow a powerful human sentiment should betake themselves to the logic of facts. An attack upon sentiment as such is foolish, for as long as convictions retain their hold the accompanying sentiment must flourish. If convictions lose sway, the sentiment dependent upon them will die a natural death. Frequent allusions to sentimental dislike by upholders of an Evolution theory only suggest that the evidence for the theory in so far as its application to man is concerned is neither clear nor conclusive. And besides, an Evolution theory dependent largely on laws of association should be most ready to recognize the power of sentimental likes and dislikes.

In this connection it is well to observe what is the nature and range of evidence required. To suggest that in the man-like apes, such as the chimpanzee, orang, and gorilla, we have the link of connection between man and the lower orders of animals, may be in some respects very helpful for the theory, as aiding the imagination in its attempt to construct a general scheme of existence, and determining a line of inquiry. But in other respects the suggestion is anything but helpful. If it carries our observation nearer to animal life and to imaginable modifications of organism, it carries it disagreeably near to brute life of an exceedingly low type, and far away from the grand characteristics of man. There are very many animals which awaken human interest much more easily and pleasantly than apes. Hence the antagonism of sentiment against which evolutionists have been constrained to cry out. But the real point to be remarked is the value of the evidence obtained by study of the nature of apes when brought into comparison with human nature. The ape's likeness to man in outward con-

formation and internal structure are facts of considerable importance in the line of evidence, and cannot be overlooked. In view of the low type of intelligence belonging to these animals, it would, however, be a considerable gain to the theory were the structural similarity not so obvious. For it must be observed, that similarity in skeleton, and muscular arrangement, and brain development, presents a body of evidence of secondary value for establishing the conclusion upheld. Intelligence presents the real test; and if the intelligence of the apes is seriously deficient, and greatly inferior to that discovered in many other animals, it is a serious perplexity for the theory that the physical configuration should be so analogous to that of man.[1]

But what is specially to be urged here is that the test of intelligence is applied in a very perfunctory and insufficient way. The moral life of man presents one of the most obvious and searching points of comparison between man and the lower animals. Rather we may say it brings out to view the most striking contrasts, and if the upholders of a theory are to make good its claim to acceptance, they must deal with the perplexities in the line of evidence, and not with easier and more favorable forms of illustration. More especially it must be kept in view that the moral nature of man must be proved to be an evolution from animal life if a theory of development from lower orders is to be maintained. And as moral nature is very generally recognized to be a contrast to animal nature; as in the history of man himself moral life is regarded in such a light as to imply by its very nature the subordination of animal life to its sway, the perplexity for the theory is at this point the most serious which can be encountered.

For the purpose of illustrating what is really involved, it will be desirable to take an outstanding characteristic of moral life, such as JUSTICE, which may be regarded either as a law to which human life is subjected, or as an excellence or virtue possessed in greater measure by some men than by others. The radical consideration will be found in the former of these. Men as rational beings uniformly admit their subjection in life to the

[1] This argument is developed in the volume on "Science and Religion," containing the Morse Lectures I delivered in New York.

law of Justice. They certainly do not uniformly submit to this law, for injustice is common enough in society, leading to much outcry on account of the wrongs inflicted by man upon man; but this outcry indicates what is uniformly recognized as the law of right, and what is as uniformly condemned as wrong, or inconsistent with the conditions of human life. We have, therefore, in this a well-known characteristic of human life, suitable as a test for any theory professing to explain the origin of man by accounting for the relative place he holds in the universe.

In acknowledgment of the law of Justice, all men allow that definite restrictions are placed upon their actions in so far as these bear on the interests of others, granting as they do that their fellow-men have certain claims upon them while living in contiguity. Hence we observe in society a special importance assigned to Justice as a law providing for the measuring out of what is fair to all. It leaves ample scope for the special relations of friendship uniting certain individuals in closer bonds than are implied in the recognized unity of the race. But Justice prescribes equality of rights among men, and equality of duties; a double type of equality, the admission of which carries with it both restrictions and obligations applicable to all members of the race. When we deal with a conception so general as this, including within its sweep all men equally, yet allowing for all possible diversity of circumstances, there is naturally considerable difficulty in defining and interpreting the principle of Justice in abstract form. But this does not occasion any practical difficulty in the government of human life, or throw any dubiety over the authoritative character of the law of Justice. Men enter into engagements with each other, press their own claims upon others, and meet the claims made by others upon them; while alongside of all this the administration of law, civil and criminal, proceeds without misgiving as to the indubitable authority of Justice. There can, therefore, be no question as to the fact that human intelligence readily accepts the principle of Justice as an essential rule of life. If, nevertheless, men commonly experience difficulty in attempting to explain what Justice is, this is a fact of considerable interest and importance within the sphere of Moral Philosophy, and a fact which does

not promise to lighten the difficulties of an Evolution theory, but rather to add to their weight in so far as such a theory attempts to account for the origin of man.

Keeping meanwhile, however, exclusively to the practical phases of the laws of moral life, it is obvious that the principle of Justice as applicable to man introduces a complete *contrast* to all the prominent characteristics of animal life. Accepting the representations of animal life given by evolutionists, which are held to present the essential forces contributing to modification of organism such as is implied in a process of advancing development, the following may be taken as the most important. On account of limited supply of food, there is amongst animals a struggle for existence; in this conflict the strength of the combatants determines the result, the strongest prevail by driving off the weaker—that is, the strong are nourished at the expense of the weak; the consequence is that the offspring of the one order is robust, of the other, puny and ready to die; and in the natural order of things there is survival of the fittest. Such are the facts and such is the theory, and both must command a ready assent. But this being granted, it is affirmed that there is not any such thing present to the intelligence of animals as a principle of Justice. In their history it is desire which moves, and in each case strength or mere brute force determines the result; for whatever amount of intelligence animals appear to possess, they are not seen to reflect on questions of Justice or to shape their conduct in accordance with the rule of life uniformly acknowledged by men.

If now we pass over from this representation of animal life to the most familiar features of human life, the contrast is marked. We may, indeed, take account of the large amount of injustice perpetrated in human history; but as we expose and denounce it, we bear witness to the universal acknowledgment that human life is placed under different conditions than animal life, and that human conduct is to be tested by a standard requiring of man a line of action exactly the contrary of what we are to expect from the lower animals. Whatever the limits of our food supply or of other sources of gratification of a greatly higher order than are contemplated by animals, and however inevitable may be competition for the objects desired, men do

not encounter this competition in the same manner as the animals. Besides the desires which they may have in common with the animals, and the competition in which they as well as the animals may be involved, they reflect on what ought to be in the relation of man to man. Reflection of this kind is distinguished from the intelligence of the animals. Men recognize a rule of life which changes animal competition into an iniquity, and requires that blind impulse be kept in subjection for attainment of higher ends than self-indulgence, making the good of others an end of personal activity, and the rights of others inalienable, whatever be the force of personal caprice or passion. In this way it is recognized that it is just as truly wrong for a strong man to injure a weak man as it is for the weak man to injure the strong in any form which may be within his power.

The most ordinary and familiar facts of moral life thus present a manifest perplexity in the path of a theory which seeks to account for the origin of man by natural development from a lower order of life in the world. For the purposes of the theory an approximation of the lower and higher forms of life should be manifest, whereas there is an obvious separation. We can, indeed, speak with perfect accuracy of the scale of animal life as including man within its range, for we can rise from the mollusk upwards to man without encountering any serious break in the line of progression. There is at least no such break that the scientific imagination may not readily bridge it over. But when we pass from the progress of organism to the progress of intelligence, we are so far from discovering the continuity traceable on the other line that we find in human life an application of intelligence which not only checks, but on rational grounds utterly condemns all those characteristics of animal competition on which a development theory of organized existence depends for its vindication as a professedly scientific explanation of human nature.

At this point Moral Philosophy comes into the field, to gather up the special facts bearing witness to moral life in man, and to seek a rational explanation of these facts as they are recognized in the ordinary relations of men. The questions which Moral Philosophy has to discuss are such as these: How does man come to recognize as authoritative over his whole life

a moral law, such as Justice, to which reference has been made above? Can we trace the possession of this knowledge to the continuous influence of sensibilities such as we have in common with the higher animals, dogs, horses, and apes? Or does the knowledge of moral law present such characteristics as to make it impossible to maintain that it comes to us through the avenues of sensibility and reflection? Here there is diversity of opinion among moral philosophers, some maintaining that moral law is an advanced generalization flowing from observation of the conditions of our sensibility, while others maintain that this knowledge is not confined to those who enter on such study, and is not accepted by men generally from philosophers as if on their authority or on evidence of their inductions. The ultimate results of ethical inquiry as to the conditions of our knowledge of moral law are, however, intimately connected with the prospects of an Evolution theory, when facing the peculiar perplexities of man's position, as a being the wealth and grandeur of whose life is not included within the results of physiological inquiry. Hence it is that those who are professedly naturalists are found recording and discussing peculiar occurrences in animal life which seem to bear something of a moral complexion, and those who are evolutionists of a more philosophic type hurry forward, as Herbert Spencer has done, to a discussion of *The Data of Ethics* as presenting the highest and severest test of the theory they have espoused.

Moral Philosophy is, however, concerned with more than a philosophy of our knowledge of moral distinctions. It must also seek a trustworthy explanation of the conditions required for subjection of all the stronger impulses of our nature in harmony with the requirements of moral law. In this connection we are brought face to face with the inconsistencies prevalent in human life, and constantly referred to by those who aim at establishing close relations between men and animals. 'Moral Philosophy has to search beyond these inconsistencies and underneath them for the possible harmony of the intellectual and impulsive powers of our nature. It is in this region we come upon the deepest mysteries of human life, laying bare to observation these two strange possibilities—that of descending to a level lower than the brutes and that of ascending to a moral

elevation which removes man immeasurably above all else that exists on earth.

The possibility of deterioration in a single lifetime (and not at all as the result of organic changes affecting successive generations) is one of the great perplexities for an Evolution theory. This hypothesis turns attention so much on the unfolding of latent powers that we are tempted to overlook the fact of *regress* standing in contrast to *progress*. A man of well-developed physical power can in a few years descend to a level of degradation quite beneath what can occur in the case of any animal. Physical deterioration may be the consequence, but immoral indulgence is the cause. The possibilities of the higher nature reach downwards as well as upwards. There is a descent which is not possible to organic life; there is also an ascent quite beyond the reach of organic evolution, as appears from the fact that the best developed physique is no guarantee for the highest human attainments. Now moral degeneracy in a single life—that is, in the case of a single member of a family all the members of which are equally affected by a law of heredity, so far as parentage is concerned—presents phenomena entirely different from those recorded by naturalists under the head of "Degeneration." The contrast may be presented by a quotation from Professor Lancaster's book on "Degeneration: A Chapter in Darwinism." Lancaster says: "Degeneration may be defined as a gradual change of the structure in which the organism becomes adapted to *less* varied and *less* complex conditions of life; whilst elaboration is a gradual change of structure in which the organism becomes adapted to more and more varied and complex conditions of life" (p. 32). That there is such degeneration in animal history as here described, is a position established on ample evidence; and that the phenomena of such degeneration are quite different from the phenomena of moral degeneracy is equally apparent. Deterioration in organism by gradual change is possible in human history as seen in generations of the same family or nation; but deterioration in *personal* history, which is first moral and then physical, cannot be included under the description which Lancaster gives. The phenomena are not explained by reference to organism. Intelligence and imagination are directed on self-indulgence; the

power of passion is fostered by thought and fancy; the ruling powers are perverted to the service of unholy desire; the man becomes the slave of passion, and in due course he is a wreck of humanity. There is nothing hyperbolical in this language; nothing in the direction, which Dr. Bain suggests, of vilifying vice in order to pay a compliment to virtue. The slavery is a verity, and the deterioration is of a kind unknown in the history of organism, worse than appears in animal life in any of its subordinate orders. That such sudden and serious deterioration is possible, is a fact altogether adverse to the theory which would account for man's superiority by organic evolution.

A similar perplexity appears in the possibility of moral elevation in individual history. Reflection as to the *right* in human conduct, and self-direction in accordance with such reflection, lead to such attainment in individual history as is not reached under the laws of organic evolution. That which we denominate loftiness of character, which wins our admiration, giving an inexpressible dignity to human life, and securing our trust, has a history of its evolution which cannot be included under laws of organism. Here are laws of intelligence and self-control of which not the most meagre explanation is offered in the most advanced treatises on Physiology. And if we advance to works more properly philosophical belonging to the Evolution school, we are not much farther advanced. We take the words of Herbert Spencer: "The truth that the ideally moral man is one in whom the moving equilibrium is perfect, or approaches nearest to perfection, becomes, when translated into physiological language, the truth that he is one in whom the functions of all kinds are duly fulfilled" (*The Data of Ethics*, § 30, p. 75). There is not much to quarrel with in such a statement as this, but it tells us very little, containing little of a science or philosophy of the elevation of moral character. "The functions of all kinds are duly fulfilled." Suppose we agree as to "the functions of all kinds" appropriate to human life, what is meant by all these being "duly fulfilled"? The statement implies a standard of comparison, or scale of relative values, which, being recognized, enables the agent himself, or observers of his conduct, to say that all parts of his nature are having a due measure of exercise. There is a reasonable enough meaning

in such a statement, readily obtaining assent on the general ground that our nature is a harmony, or that life is a unity, all its powers being parts of a totality. But what specially requires attention here is that this is not the method by which men decide what is *due* to the several powers, or what is *dutiful* in conduct. Whether the lungs and the limbs, the heart and the hands, are having a due measure of activity, is not the form of inquiry before the agent when he determines what is due or dutiful. In few cases does the agent possess such knowledge of the several powers of his nature as to make this possible, and even in the few cases where such knowledge is possessed it does not supply the data on which the agent proceeds to judge of right conduct. The attempt to work out the problem of life with the formulæ of organism is a failure; "moving in equilibrium" is a phrase of no meaning, such meaning as it can bear having no application to the case in hand.

There thus stands unanswered the question—which is the first grand question of Moral Philosophy: How does man determine what is Duty? It is one of the commonplaces of moral science that this question involves two distinct inquiries: How or by what *process* do we reach a decision; why or on what *data* do we decide? That questions of duty imply an exercise of judgment is now admitted on all hands, however great the theoretic differences separating ethical inquirers. Proceeding beyond this to the second aspect of the question, it is clear that the ground on which we determine duty is not discovered by ascertaining how equilibrium of functions is maintained. Any attempt in this direction would imply that the agent is in possession of a complete knowledge of the complicated order of powers belonging to him, which it would be hopeless to maintain. Accordingly the experiential philosophers turn to a calculation of pleasures and pains as affording the standard of the right, and thus of the dutiful. This brings us somewhat closer upon every-day life, but improves matters little in the way of providing a science of human duty, guiding to moral elevation. The equilibrium of pleasures and pains is not, indeed, a subject unknown to human thought; the greater and the less in matters of enjoyment are often decided, and that very frequently, without any allusion to the question of duty.

But the equilibrium of pleasures and pains possible to humanity, so far as it is capable of being determined by personal conduct, is as remote from common reflection and as difficult for ordinary intelligence as the equilibrium of functions.

How then does the Evolution scheme seek to encompass the ordinary regard to what is due or dutiful? Herbert Spencer may be taken as the most advanced and uncompromising representative of the school. According to him the explanation is found in the evolution of conduct. Conduct is "the adjustment of acts to ends;" "a large part of ordinary conduct is (ethically) indifferent;" "the transition from indifferent acts to acts which are good or bad is gradual;" "we have to frame a conception of the evolution of conduct as correlated with the evolution of structures and functions;" there is adjustment of acts for increased duration of life, for the life of the species, and a still higher phase of evolution is reached when "the members of a society give mutual help in the achievement of ends;" "ethics has for its subject-matter that form which universal conduct assumes during the last stages of its evolution;" hence "conduct gains ethical sanction in proportion as the activities . . . consist with, and are furthered by, co-operation and mutual aid." Such, in outline, is Herbert Spencer's answer—an answer so insufficient as to betray the inadequacy of the Evolution scheme to account for moral distinctions as recognized in simple determination of personal duty. From whatever point it is regarded this is obvious. Adjustment of acts to ends is so wide as to require immediate admission that this does not bring us within sight of moral distinctions. To affirm that a large part of conduct is ethically indifferent, is to grant at the outset that some ground of distinction is recognized other than adaptation of acts to ends. The transition to more complicated acts does not help by a single step; for a large part of the most complicated activity is ethically indifferent. The introduction of mutual help does not improve matters; for here, also, the distinction is to be established between mutual interest and dutiful conduct. The ground on which we consider certain courses of action as dutiful is not discovered. There is here neither a science of the highest functions nor a philosophy of moral distinctions. The barriers of an Evolution theory have

proved that it is insufficient to encompass the higher characteristics of human life.

The inquiry remains, "Whence comes the sentiment of duty?" This question Herbert Spencer answers thus: "It is an abstract sentiment generated in a manner analogous to that in which abstract ideas are generated." The abstract idea of color is taken as the illustration, and thus it is said that an abstract idea "often acquires an *illusive independence*." Does, then, illusive independence adhere to the idea of duty? The mere suggestion betrays the weakness of the theory. Duty has of all ideas the most obvious inherent independence. "The Imperative" of human life, that authority which is recognized as superior to personal inclinations, and to the subtlest sophistries, cannot be identified with abstract conceptions merely. Each single illustration of duty tells of an authority which commands passion to be subject, and requires all personality to obey. It is vain to attempt to drag duty from its true dignity. All thought of man concerning duty, all reasoning within as to its fulfilment, all reproaches as to its neglect, all demands it sanctions upon our fellow-men whatever their rank, all the stern condemnation we utter upon the conduct of those who wrong us—all these tell that there is an inherently right in human conduct, an everlastingly authoritative, which no evolution of organic activity can approach, and to which no experiential philosophy can do justice.

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SOCIOLOGY.

EACH of the sciences which, by giving to man greater knowledge of the laws of nature, has enabled him to cope more intelligently with the ills of life, has had to fight for its independence of metaphysics. We have still lectures on metaphysical biology in some of our colleges and in some of our public courses, but biology has substantially won its independence. Anthropology is more likely to give laws to metaphysics than to accept laws from that authority. Sociology, however, the latest of this series of sciences, is rather entering upon the struggle than emerging from it. Sociology threatens to withdraw an immense range of subjects of the first importance from the dominion of *a priori* speculation and arbitrary dogmatism, and the struggle will be severe in proportion to the dignity and importance of the subject. The struggle, however, is best carried forward indirectly, by simply defining the scope of sociology, and by vindicating its position amongst the sciences, while leaving its relations to the other sciences and other pursuits of men to adjust themselves according to the facts. I know of nothing more amusing in these days than to see an old-fashioned metaphysician applying his tests to the results of scientific investigation, and screaming with rage because men of scientific training do not care whether the results satisfy those tests or not.

Sociology is the science of life in society. It investigates the forces which come into action wherever a human society exists. It studies the structure and functions of the organs of human society, and its aim is to find out the laws[1] in subordi-

[1] It has been objected that no proof is offered that social laws exist in the order of nature. By what demonstration could any such proof be given *a priori?* If a

nation to which human society takes its various forms, and social institutions grow and change. Its practical utility consists in deriving the rules of right social living from the facts and laws which prevail by nature in the constitution and functions of society. It must, without doubt, come into collision with all other theories of right living which are founded on authority, tradition, arbitrary invention, or poetic imagination.

Sociology is perhaps the most complicated of all the sciences, yet there is no domain of human interest the details of which are treated ordinarily with greater facility. Various religions have various theories of social living, which they offer as authoritative and final. It has never, so far as I know, been asserted by anybody that a man of religious faith (in any religion) could not study sociology or recognize the existence of any such science; but it is incontestably plain that a man who accepts the dogmas about social living which are imposed by the authority of any religion must regard the subject of right social living as settled and closed, and he cannot enter on any investigation the first groundwork of which would be doubt of the authority which he recognizes as final. Hence social problems and social phenomena present no difficulty to him who has only to cite an authority or obey a prescription.

Then again the novelists set forth "views" about social matters. To write and read novels is perhaps the most royal road to teaching and learning which has ever been devised. The proceeding of the novelists is kaleidoscopic. They turn the same old bits of colored glass over and over again into new combinations. There is no limit, no sequence, no bond of consistency. The romance-writing social philosopher always proves his case just as a man always wins who plays chess with himself.

Then again the utopians and socialists make easy work of the complicated phenomena with which sociology has to deal. These persons, vexed with the intricacies of social problems, and revolting against the facts of the social order, take upon themselves the task of inventing a new and better world.

man of scientific training finds his attention arrested, in some group of phenomena, by those sequences, relations, and recurrences which he has learned to note as signs of action of law, he seeks to discover the law. If it exists, he finds it. What other proof of its existence could there be?

They brush away all which troubles us men, and create a world free from annoying limitations and conditions—in their imagination. In ancient times, and now in half-civilized countries, these persons have been founders of religions. Something of that type always lingers around them still and among us, and is to be seen amongst the reformers and philanthropists who never contribute much to the improvement of society in any actual detail, but find a key principle for making the world anew and regenerating society. I have even seen faint signs of the same mysticism in social matters in some of the greenbackers who have "thought out" in bed, as they relate, a scheme of wealth by paper money, as Mahomet would have received a Surah, or Joe Smith a revelation about polygamy. Still there are limits to this resemblance, because in our nineteenth-century American life a sense of humor, even if defective, answers some of the purposes of common-sense.

Then again all the whimsical people who have hobbies of one sort or another, and who cluster around the Social Science Association, come forward with projects which are the result of a strong impression, an individual misfortune, or an unregulated benevolent desire, and which are therefore the product of a facile emotion, not of a laborious investigation.

Then again the *dilettanti* make light work of social questions. Every one, by the fact of living in society, gathers some observations of social phenomena. The belief grows up, as it was expressed some time ago by a professor of mathematics, that everybody knows about the topics of sociology. Those topics have a broad and generous character. They lend themselves easily to generalizations. There are as yet no sharp tests formulated. Above all, and worst lack of all as yet, we have no competent criticism. Hence it is easy for the aspirant after culture to venture on this field without great danger of being brought to account, as he would be if he attempted geology, or physics, or biology. Even a scientific man of high attainments in some other science, in which he well understands what special care, skill, and training are required, will not hesitate to dogmatize about a topic of sociology. A group of half-educated men may be relied upon to attack a social question and to hammer it dead in a few minutes with a couple of commonplaces and a

sweeping *a priori* assumption. Above all other topics, social topics lend themselves to the purposes of the diner-out.

Two facts, however, in regard to social phenomena need only be mentioned to be recognized as true. (1) Social phenomena always present themselves to us in very complex combinations, and (2) it is by no means easy to interpret the phenomena. The phenomena are often at three or four removes from their causes. Tradition, prejudice, fashion, habit, and other similar obstacles continually warp and deflect the social forces, and they constitute interferences whose magnitude is to be ascertained separately for each case. It is also impossible for us to set up a social experiment. To do that, we should need to dispose of the time and liberty of a certain number of men. It follows that sociology requires a special method, and that probably no science requires such peculiar skill and sagacity in the observer and interpreter of the phenomena which are to be studied. One peculiarity may be especially noted because it shows a very common error of students of social science. A sociologist needs to arrange his facts before he has obtained them; that is to say, he must make a previous classification so as to take up the facts in a certain order. If he does not do this he may be overwhelmed in the mass of his material so that he never can master it. How shall any one know how to classify until the science itself has made some progress? Statistics furnish us the best illustration at the present time of the difficulty here referred to.

When, now, we take into account these difficulties and requirements, it is evident that the task of sociology is one which will call for especial and long training, and that it will probably be a long time yet before we can train up any body of special students who will be so well trained in the theory and science of society as to be able to form valuable opinions on points of social disease and social remedy. But it is a fact of familiar observation that all popular discussions of social questions seize directly upon points of social disease and social remedies. The diagnosis of some asserted social ill and the prescription of the remedy are undertaken offhand by the first comer, and without reflecting that the diagnosis of a social disease is many times harder than that of a disease in an individual, and that to prescribe for a society is to prescribe for an organism which is

immortal. To err in prescribing for a man is at worst to kill him; to err in prescribing for a society is to set in operation injurious forces which extend, ramify, and multiply their effects in ever new combinations throughout an indefinite future. It may pay to experiment with an individual because he cannot wait for medical science to be perfected; it cannot pay to experiment with a society because the society does not die and can afford to wait.

If we have to consider the need of sociology, innumerable reasons for studying it present themselves. In spite of all our acquisitions in natural science, the conception of a natural law (which is the most important good to be won from studying natural science) is yet exceedingly vague in the minds of ordinary intelligent people, and is very imperfect even amongst the educated. That conception is hardly yet applied by anybody to social facts and problems. Social questions force themselves upon us in multitudes every year as our civilization advances and our society becomes complex. When such questions arise they are wrangled over and tossed about without any orderly discussion, but as if they were only the sport of arbitrary whims. Is it not then necessary that we enable ourselves, by study of the facts and laws of society, to take up such questions from the correct point of view, and to proceed with the examination of them in such order and method that we can reach solid results, and thus obtain command of an increasing mass of knowledge about social phenomena? The assumption which underlies almost all discussion of social topics is that we men need only make up our minds what kind of a society we want to have, and that then we can devise means for calling that society into existence. It is assumed that we can decide to live on one spot of the earth's surface or another, and to pursue there one industry or another, and then that we can, by our devices, make that industry as productive as any other could be in that place. People believe that we have only to choose whether we will have aristocratic institutions or democratic institutions. It is believed that statesmen can, if they will, put a people in the way of material prosperity. It is believed that rent on land can be abolished if it is not thought expedient to have it. It is assumed that peasant proprietors can be brought

into existence anywhere where it is thought that it would be an advantage to have them. These illustrations might be multiplied indefinitely. They show the need of sociology, and if we should go on to notice the general conceptions of society, its ills and their remedies, which are held by various religious, political, and social sects, we should find ample further evidence of the need of sociology.

Let us then endeavor to define the field of sociology. Life in society is the life of a human society on this earth. Its elementary conditions are set by the nature of human beings and the nature of the earth. We have already become familiar, in biology, with the transcendent importance of the fact that life on earth must be maintained by a struggle against nature, and also by a competition with other forms of life. In the latter fact biology and sociology touch. Sociology is a science which deals with one range of phenomena produced by the struggle for existence, while biology deals with another. The forces are the same, acting on different fields and under different conditions. The sciences are truly cognate. Nature contains certain materials which are capable of satisfying human needs, but those materials must, with rare and mean exceptions, be won by labor, and must be fitted to human use by more labor. As soon as any number of human beings are each struggling to win from nature the material goods necessary to support life, and are carrying on this struggle side by side, certain social forces come into operation. The prime condition of this society will lie in the ratio of its numbers to the supply of materials within its reach. For the supply at any moment attainable is an exact quantity, and the number of persons who can be supplied is arithmetically limited. If the actual number present is very much less than the number who might be supported, the condition of all must be ample and easy. Freedom and facility mark all social relations under such a state of things. If the number is larger than that which can be supplied, the condition of all must be one of want and distress, or else a few must be well provided, the others being proportionately still worse off. Constraint, anxiety, possibly tyranny and repression mark social relations. It is when the social pressure due to an unfavorable ratio of population to land

becomes intense that the social forces develop increased activity. Division of labor, exchange, higher social organization, emigration, advance in the arts, spring from the necessity of contending against the harsher conditions of existence which are continually reproduced as the population surpasses the means of existence on any given status.

The society with which we have to deal does not consist of any number of men. An army is not a society. A man with his wife and his children constitutes a society, for its essential parts are all present, and the number more or less is immaterial. A certain division of labor between the sexes is imposed by nature. The family as a whole maintains itself better under an organization with division of labor than it could if the functions were shared so far as possible. From this germ the development of society goes on by the regular steps of advancement to higher organization, accompanied and sustained by improvements in the arts. The increase of population goes on according to biological laws which are capable of multiplying the species beyond any assignable limits, so that the number to be provided for steadily advances, and the status of ease and abundance gives way to a status of want and constraint. Emigration is the first and simplest remedy. By winning more land the ratio of population to land is once more rendered favorable. It is to be noticed, however, that emigration is painful to all men. To the uncivilized man, to emigrate means to abandon a mass of experiences and traditions which have been won by suffering, and to go out to confront new hardships and perils. To the civilized man migration means cutting off old ties of kin and country. The earth has been peopled by man at the cost of this suffering.

On the side of the land also stands the law of the diminishing return as a limitation. More labor gets more from the land, but not proportionately more. Hence, if more men are to be supported, there is need not of a proportionate increase of labor, but of a disproportionate increase of labor. The law of population, therefore, combined with the law of the diminishing return constitutes the great underlying condition of society. Emigration, improvements in the arts, in morals, in education, in political organization, are only stages in the struggle of man to meet

these conditions, to break their force for a time, and to win room under them for ease and enlargement. Ease and enlargement mean either power to support more men on a given stage of comfort or power to advance the comfort of a given number of men. Progress is a word which has no meaning save in view of the laws of population and the diminishing return, and it is quite natural that any one who fails to understand those laws should fall into doubt which way progress points, whether towards wealth or poverty. The laws of population and the diminishing return, in their combination, are the iron spur which has driven the race on to all which it has ever achieved, and the fact that population ever advances, yet advances against a barrier which resists more stubbornly at every step of advance, unless it is removed to a new distance by some conquest of man over nature, is the guarantee that the task of civilization will never be ended, but that the need for more energy, more intelligence, and more virtue will never cease while the race lasts. If it were possible for an increasing population to be sustained by proportionate increments of labor, we should all still be living in the original home of the race on the spontaneous products of the earth. Let him, therefore, who desires to study social phenomena first learn the transcendent importance for the whole social organization, industrial, political, and civil, of the ratio of population to land.

We have noticed that the relations involved in the struggle for existence are two-fold. There is first the struggle of individuals to win the means of subsistence from nature, and secondly there is the competition of man with man in the effort to win a limited supply. The radical error of the socialists and sentimentalists is that they never distinguish these two relations from each other. They bring forward complaints which are really to be made, if at all, against the author of the universe for the hardships which man has to endure in his struggle with nature. The complaints are addressed, however, to society; that is, to other men under the same hardships. The only social element, however, is the competition of life, and when society is blamed for the ills which belong to the human lot, it is only burdening those who have successfully contended with those ills with the further task of conquering the same ills over again

for somebody else. Hence liberty perishes in all socialistic schemes, and the tendency of such schemes is to the deterioration of society by burdening the good members and relieving the bad ones. The law of the survival of the fittest was not made by man and cannot be abrogated by man. We can only, by interfering with it, produce the survival of the unfittest. If a man comes forward with any grievance against the order of society so far as this is shaped by human agency, he must have patient hearing and full redress; but if he addresses a demand to society for relief from the hardships of life, he asks simply that somebody else should get his living for him. In that case he ought to be left to find out his error from hard experience.

The sentimental philosophy starts from the first principle that nothing is true which is disagreeable, and that we must not believe anything which is "shocking" no matter what the evidence may be. There are various stages of this philosophy. It touches on one side the intuitional philosophy which proves that certain things must exist by proving that man needs them, and it touches on the other side the vulgar socialism which affirms that the individual has a right to whatever he needs, and that this right is good against his fellowmen. To this philosophy in all its grades the laws of population and the diminishing return have always been very distasteful. The laws which entail upon mankind an inheritance of labor cannot be acceptable to any philosophy which maintains that man comes into the world endowed with natural rights, and an inheritor of freedom. It is a death-blow to any intuitional philosophy to find out, as an historical fact, what diverse thoughts, beliefs, and actions man has manifested, and it requires but little actual knowledge of human history to show that the human race has never had any ease which it did not earn, or any freedom which it did not conquer. Sociology, therefore, by the investigations which it pursues dispels illusions about what society is or may be, and gives instead knowledge of facts which are the basis of intelligent effort by man to make the best of his circumstances on earth. Sociology, therefore, which can never accomplish anything more than to enable us to make the best of our situation, will never be able to reconcile itself with those philosophies which are trying to find

out how we may arrange things so as to satisfy any ideal of society.

The competition of life has taken the form, historically, of a struggle for the possession of the soil. In the simpler states of society the possession of the soil is tribal, and the struggles take place between groups, producing the wars and feuds which constitute almost the whole of early history. On the agricultural stage the tribal or communal possession of land exists as a survival, but it gives way to private property in land whenever the community advances and the institutions are free to mould themselves. The agricultural stage breaks up tribal relations and encourages individualization. This is one of the reasons why it is such an immeasurable advance over the lower forms of civilization. It sets free individual energy, and, while the social bond gains in scope and variety, it also gains in elasticity, for the solidarity of the group is broken up, and the individual may work out his own ends by his own means, subject only to the social ties which lie in the natural conditions of human life. It is only on the agricultural stage that liberty as civilized men understand it exists at all. The poets and sentimentalists, untaught to recognize the grand and world-wide co-operation which is secured by the free play of individual energy under the great laws of the social order, bewail the decay of early communal relations, and exalt the liberty of the primitive stages of civilization. These notions all perish at the first touch of actual investigation. The whole retrospect of human history runs downwards towards beast-like misery and slavery to the destructive forces of nature. The whole history has been one series of toilsome, painful, and bloody struggles, first to find out where we were and what were the conditions of greater ease, and then to devise means to get relief. Most of the way the motives of advance have been experience of suffering and instinct. It is only in the most recent years that science has undertaken to teach without and in advance of suffering, and as yet science has to fight so hard against tradition that its authority is only slowly winning recognition. The institutions whose growth constitutes the advance of civilization have their guarantee in the very fact that they grew and became established. They suited man's purpose better than what went before. They

are all imperfect, and all carry with them incidental ills, but each came to be because it was better than what went before, and each which has perished perished because a better one supplanted it.

It follows once and for all that to turn back to any defunct institution or organization because existing institutions are imperfect is to turn away from advance and is to retrograde. The path of improvement lies forwards. Private property in land, for instance, is an institution which has been developed in the most direct and legitimate manner. It may give way at a future time to some other institution which will grow up by imperceptible stages out of the efforts of men to contend successfully with existing evils, but the grounds for private property in land are easily perceived, and it is safe to say that no *a priori* scheme of state ownership or other tenure invented *en bloc* by any philosopher and adopted by legislative act will ever supplant it. To talk of any such thing is to manifest a total misconception of the facts and laws which it is the province of sociology to investigate. The case is less in magnitude but scarcely less out of joint with all correct principle when it is proposed to adopt a unique tax on land, in a country where the rent of land is so low that any important tax on land exceeds it, and therefore becomes indirect, and where also political power is in the hands of small landowners, who hold (without ever having formulated it) a doctrine of absolute property in the soil such as is not held by any other landowners in the world.

Sociology must exert a most important influence on political economy. Political economy is the science which investigates the laws of the material welfare of human societies. It is not its province to teach individuals how to get rich. It is a social science. It was the first branch of sociology which was pursued by man as a science. It is not strange that when the industrial organization of society was studied apart from the organism of which it forms a part it was largely dominated over by arbitrary dogmatism, and that it should have fallen into disrepute as a mere field of opinion, and of endless wrangling about opinions for which no guarantees could be given. The rise of a school of "historical" economists is itself a sign of a struggle towards a positive and scientific study of political economy, in

its due relations to other social sciences, and this sign loses none of its significance in spite of the crudeness and extravagance of the opinions of the historical economists, and in spite of their very marked tendency to fall into dogmatism and hobby-riding. Political economy is thrown overboard by all groups and persons whenever it becomes troublesome. When it got in the way of Mr. Gladstone's land-bill he relegated it, by implication, to the planet Saturn, to the great delight of all the fair-traders, protectionists, soft-money men, and others who had found it in the way of their devices. What political economy needs in order to emerge from the tangle in which it it is now involved, and to win a dignified and orderly development, is to find its field and its relations to other sciences fairly defined within the wider scope of sociology. Its laws will then take their place not as arbitrary or broken fragments, but in due relation to other laws. Those laws will win proof and establishment from this relation.

For instance: We have plenty of books, some of them by able writers, in which the old-fashioned Malthusian doctrine of population and the Ricardian law of rent are disputed because emigration, advance in the arts, etc. etc., can offset the action of those laws, or because those laws are not seen in action in the United States. Obviously no such objections ever could have been raised if the laws in question had been understood or had been put in their proper bearings. The Malthusian law of population and the Ricardian law of rent are cases in which, by rare and most admirable acumen, powerful thinkers perceived two great laws in particular phases of their action. With wider information it now appears that the law of population breaks the barriers of Malthus' narrower formulæ and appears as a great law of biology. The Ricardian law of rent is only a particular application of one of the great conditions of production. We have before us not special dogmas of political economy, but facts of the widest significance for the whole social development of the race. To object that these facts may be set aside by migration or advance in the arts is nothing to the purpose, for this is only altering the constants in the equation, which does not alter the form of the curve, but only its position relatively to some standard line. Furthermore, the laws themselves indicate that they

have a maximum point for any society, or any given stage of the arts, and a condition of under-population, or of an extractive industry below its maximum, is just as consistent with the law as a condition of over-population and increasing distress. Hence inferences as to the law of population drawn from the status of an under-populated country are sure to be fallacious. In like manner arguments drawn from American phenomena in regard to rent and wages, when rent and wages are as yet only very imperfectly developed here, lead to erroneous conclusions. It only illustrates the unsatisfactory condition of political economy, and the want of strong criticism in it, that such arguments can find admission to its discussions and disturb its growth.

It is to the pursuit of sociology and the study of the industrial organization in combination with the other organizations of society that we must look for the more fruitful development of political economy. We are already in such a position with sociology that a person who has gained what we now possess of that science will bring to bear upon economic problems a sounder judgment and a more correct conception of all social relations than a person who may have read a library of the existing treatises on political economy. The essential elements of political economy are only corollaries or special cases of sociological principles. One who has command of the law of the conservation of energy as it manifests itself in society is armed at once against socialism, protectionism, paper money, and a score of other economic fallacies. The sociological view of political economy also includes whatever is sound in the dogmas of the "historical school," and furnishes what that school is apparently groping after.

As an illustration of the light which sociology throws on a great number of political and social phenomena which are constantly misconstrued, we may notice the differences in the industrial, political, and civil organization which are produced all along at different stages of the ratio of population to land.

When a country is under-populated new-comers are not competitors but assistants. If more come they may produce not only new quotas, but a surplus besides, to be divided between themselves and all who were present before. In such a state of things land is abundant and cheap. The possession of it con-

fers no power or privilege. No one will work for another for wages when he can take up new land and be his own master. Hence it will pay no one to own more land than he can cultivate by his own labor, or with such aid as his own family supplies. Hence, again, land bears little or no rent, there will be no landlords living on rent, and no laborers living on wages, but only a middle class of yeoman farmers. All are substantially on an equality, and democracy becomes the political form, because this is the only state of society in which the dogmatic assumption of equality, on which democracy is based, is realized as a fact. The same effects are powerfully re-enforced by other facts. In a new and under-populated country the industries which are most profitable are the extractive industries. The characteristic of these, with the exception of some kinds of mining, is that they call for only a low organization of labor and small amount of capital. Hence they allow the workman to become speedily his own master, and they educate him to freedom, independence, and self-reliance. At the same time, the social groups being only vaguely marked off from each other, it is easy to pass from one class of occupations, and consequently from one social grade, to another. Finally, under the same circumstances, education, skill, and superior training have but inferior value compared with what they have in densely populated countries. The advantages lie, in an under-populated country, with the coarser, unskilled, manual occupations, and not with the highest developments of science, literature, and art.

If now we turn for comparison to cases of over-population we see that the struggle for existence and the competition of life are intense where the pressure of population is great. This competition draws out the highest achievements. It makes the advantages of capital, education, talent, skill, and training tell to the utmost. It draws out the social scale upwards and downwards to great extremes, and produces aristocratic social organizations in spite of all dogmas of equality. Landlords, tenants (*i.e.*, capitalist employers), and laborers are the three primary divisions of any aristocratic order, and they are sure to be developed whenever land bears rent, and whenever tillage requires the application of large capital. At the same time

liberty has to undergo curtailment. A man who has a square mile to himself can easily do as he likes, but a man who walks Broadway at noon or lives in a tenement-house finds his power to do as he likes limited by scores of considerations for the rights and feelings of his fellow-men. Furthermore, organization with subordination and discipline is essential in order that the society as a whole may win a support from the land. In an over-populated country the extremes of wealth and luxury are presented side by side with the extremes of poverty and distress. They are equally the products of an intense social pressure. The achievements of power are highest, the rewards of prudence, energy, enterprise, foresight, sagacity, and all other industrial virtues is greatest; on the other hand, the penalties of folly, weakness, error, and vice are most terrible. Pauperism, prostitution, and crime are the attendants of a state of society in which science, art, and literature reach their highest developments. Now it is evident that over-population and under-population are only relative terms. Hence as time goes on any under-populated nation is surely moving forward towards the other status, and is speedily losing its natural advantages which are absolute, and also that relative advantage which belongs to it if it is in neighborly relations with nations of dense population and high civilization, viz., the chance to borrow and assimilate from them the products, in arts and science, of high civilization, without enduring the penalties of intense social pressure.

We have seen that if we should try by any measures of arbitrary interference and relief to relieve the victims of social pressure from the calamity of their position, we should only offer premiums to folly and vice and extend them further. We have also seen that we must go forward and meet our problems. We cannot escape them by running away. If then it be asked what the wit and effort of man can do to struggle with the problems offered by social pressure, the answer is that he can do only what his instinct has correctly and surely led him to do without any artificial social organization of any kind, and that is, by improvements in the arts, in science, in morals, in political institutions, to widen and strengthen the power of man over nature. The task of dealing with social ills is not a new task. People set about it and discuss it as if the human race had hith-

erto neglected it, and as if the solution of the problem was to be something new in form and substance, different from the solution of all problems which have hitherto engaged human effort. In truth, the human race has never done anything else but struggle with the problem of social welfare. That struggle constitutes history, or the life of the human race on earth. That struggle embraces all minor problems which occupy human attention here, save those of religion, which reaches beyond this world and finds its objects beyond this life. Every successful effort to widen the power of man over nature is a real victory over poverty, vice, and misery, taking things in general and in the long-run. It would be hard to find a single instance of a direct assault by positive effort upon poverty, vice, and misery which has not either failed or, if it has not failed directly and entirely, has not entailed other evils greater than the one which it removed. The only two things which really tell on the welfare of man on earth are hard work and self-denial (*i.e.*, in technical language, labor and capital), and these tell most when they are brought to bear directly upon the effort to earn an honest living, to accumulate capital, and to bring up a family of children to be industrious and self-denying in their turn. I repeat that this is the way to work for the welfare of man on earth; and what I mean to say is that the common notion that when we are going to work for the social welfare of man we must adopt a great dogma, organize for the realization of some great scheme, have before us an abstract ideal, or otherwise do anything but live honest and industrious lives, is a great mistake. From the stand-point of the sociologist pessimism and optimism are alike impertinent. To be an optimist one must forget the frightful sanctions which are attached to the laws of right living. To be a pessimist one must overlook the education and growth which are the product of effort and self-denial. In either case one is passing judgment on what is inevitably fixed, and on which the approval or condemnation of man can produce no effect. The facts and laws are, once and for all, so, and for us men that is the end of the matter. The only persons for whom there would be any sense in the question whether life is worth living are primarily the yet unborn children, and secondarily the persons who are proposing to found families. For these latter the

question would take a somewhat modified form: Will life be worth living for children born of me? This question is, unfortunately, not put to themselves by the appropriate persons as it would be if they had been taught sociology. The sociologist is often asked if he wants to kill off certain classes of troublesome and burdensome persons. No such inference follows from any sound sociological doctrine, but it is allowed to infer, as to a great many persons and classes, that it would have been better for society, and would have involved no pain to them, if they had never been born.

In further illustration of the interpretation which sociology offers of phenomena which are often obscure, we may note the world-wide effects of the advances in the arts and sciences which have been made during the last hundred years. These improvements have especially affected transportation and communication; that is, they have lessened the obstacles of time and space which separate the groups of mankind from each other, and have tended to make the whole human race a single unit. The distinction between over-populated and under-populated countries loses its sharpness, and all are brought to an average. Every person who migrates from Europe to America affects the comparative status of the two continents. He lessens the pressure in the country he leaves and increases it in the country to which he goes. If he goes to Minnesota, and raises wheat there, which is carried back to the country he left as cheap food for those who have not emigrated, it is evident that the bearing upon social pressure is twofold. It is evident, also, that the problem of social pressure can no longer be correctly studied if the view is confined either to the country of immigration or the country of emigration, but that it must embrace both. It is easy to see, therefore, that the ratio of population to land with which we have to deal is only in peculiar and limited cases that ratio as it exists in England, Germany, or the United States. It is the ratio as it exists in the civilized world, and every year that passes, as our improved arts break down the barriers between different parts of the earth, brings us nearer to the state of things where all the population of Europe, America, Australasia, and South Africa must be considered in relation to all the land of the same territories, for all that territory will be

available for all that population, no matter what the proportion may be in which the population is distributed over the various portions of the territory. The British Islands may become one great manufacturing city. Minnesota, Texas, and Australia may not have five persons to the square mile. Yet all will eat the meat of Texas and the wheat of Minnesota, and wear the wool of Australia manufactured on the looms of England. That all will enjoy the maximum of food and raiment under that state of things is as clear as anything possibly can be which is not yet an accomplished fact. We are working towards it by all our instincts of profit and improvement. The greatest obstacles are those which come from prejudices, traditions, and dogmas, which are held independently of any observation of facts or any correct reasoning, and which set the right hand working against the left. For instance: the Mississippi Valley was, a century ago, as unavailable to support the population of France and Germany as if it had been in the moon. The Mississippi Valley is now nearer to France and Germany than the British Islands were a century ago, reckoning distance by the only true standard, viz., difficulty of communication. It is a fair way of stating it to say that the improvements in transportation of the last fifty years have added to France and Germany respectively a tract of land of the very highest fertility, equal in area to the territory of those states, and available for the support of their population. The public men of those countries are now declaring that this is a calamity, and are devising means to counteract it.

The social and political effects of the improvements which have been made must be very great. It follows from what we have said about the effects of intense social pressure and high competition, that the effect of thus bringing to bear on the great centres of population the new land of outlying countries must be to relieve the pressure in the oldest countries and at the densest centres. Then the extremes of wealth and poverty, culture and brutality, will be contracted, and there will follow a general tendency towards an average equality which, however, must be understood only within very broad limits. Such is no doubt the meaning of the general tendency towards equality, the decline of aristocratic institutions, the rise of the proletariat, and

the ambitious expansion, in short, which is characteristic of modern civilized society. It would lead me too far to follow out this line of speculation as to the future, but two things ought to be noticed in passing. (1) There are important offsets to the brilliant promise which there is for mankind in a period during which, for the whole civilized world, there will be a wide margin of ease between the existing population and the supporting power of the available land. These offsets consist in the effects of ignorance, error, and folly—the same forces which have always robbed mankind of half what they might have enjoyed on earth. Extravagant governments, abuses of public credit, wasteful taxation, legislative monopolies and special privileges, juggling with currency, restrictions on trade, wasteful armaments on land and sea, and other follies in economy and state-craft, are capable of wasting and nullifying all the gains of civilization. (2) The old classical civilization fell under an irruption of barbarians from without. It is possible that our new civilization may perish by an explosion from within. The sentimentalists have been preaching for a century notions of rights and equality, of the dignity, wisdom, and power of the proletariat, which have filled the minds of ignorant men with impossible dreams. The thirst for luxurious enjoyment has taken possession of us all. It is the dark side of the power to foresee a possible future good with such distinctness as to make it a motive of energy and persevering industry—a power which is distinctly modern. Now the thirst for luxurious enjoyment, when brought into connection with the notions of rights, of power, and of equality, and dissociated from the notions of industry and economy, produces the notion that a man is robbed of his rights if he has not everything that he wants, that he is deprived of equality if he sees any one have more than he has, and that he is a fool if, having the power of the state in his hands, he allows this state of things to last. Then we have socialism, communism, and nihilism; and the fairest conquests of civilization, with all their promise of solid good to man, on the sole conditions of virtue and wisdom, may be scattered to the winds in a war of classes, or trampled under foot by a mob which can only hate what it cannot enjoy.

It must be confessed that sociology is yet in a tentative and

inchoate state. All that we can affirm with certainty is that social phenomena are subject to law, and that the natural laws of the social order are in their entire character like the laws of physics. We can draw in grand outline the field of sociology and foresee the shape that it will take and the relations it will bear to other sciences. We can also already find the standpoint which it will occupy, and, if a figure may be allowed, altho we still look over a wide landscape largely enveloped in mist, we can see where the mist lies, and define the general features of the landscape, subject to further corrections. To deride or contemn a science in this state would certainly be a most unscientific proceeding. We confess, however, that so soon as we go beyond the broadest principles of the science we have not yet succeeded in discovering social laws, so as to be able to formulate them. A great amount of labor yet remains to be done in the stages of preparation. There are, however, not more than two or three other sciences which are making as rapid progress as sociology, and there is no other which is as full of promise for the welfare of man. That sociology has an immense department of human interests to control is beyond dispute. Hitherto this department has been included in moral science, and it has not only been confused and entangled by dogmas no two of which are consistent with each other, but also it has been without any growth, so that at this moment our knowledge of social science is behind the demands which existing social questions make upon us. We are face to face with an issue no less grand than this: Shall we, in our general social policy, pursue the effort to realize more completely that constitutional liberty for which we have been struggling throughout modern history, or shall we return to the mediæval device of functionaries to regulate procedure and to adjust interests? Shall we try to connect with liberty an equal and appropriate responsibility as its essential complement and corrective, so that a man who gets his own way shall accept his own consequences, or shall we yield to the sentimentalism which, after preaching an unlimited liberty, robs those who have been wise out of pity for those who have been foolish? Shall we accept the inequalities which follow upon free competition as the definition of justice, or shall we suppress free competition in the

interest of equality, and to satisfy a baseless dogma of justice? Shall we try to solve the social entanglements which arise in a society where social ties are constantly becoming more numerous and more subtle, and where contract has only partly superseded custom and status, by returning to the latter, only hastening a more complete development of the former? These certainly are practical questions, and their scope is such that they embrace a great number of minor questions which are before us and which are coming up. It is to the science of society, which will derive true conceptions of society from the facts and laws of the social order, studied without prejudice or bias of any sort, that we must look for the correct answer to these questions. By this observation the field of sociology and the work which it is to do for society are sufficiently defined.

WILLIAM G. SUMNER.

THE ORIGIN AND DEVELOPMENT OF MUSICAL SCALES.

IT is an odd notion that has acquired currency among a certain class of music teachers, and which occasionally crops out in print or in conversation, that there is such a thing as a *natural* musical scale or gamut; that is, that the voice in passing from any given tone to its octave is mysteriously constrained by the nature of things to make the ascent not only by leaps or intervals, but even by the particular intervals that constitute the major scale of modern music. The impossibility of demonstrating this idea by an experiment upon a man absolutely devoid of musical experience is not greater than the improbability of a successful result. A moment's reflection reveals the fact that scales are not the only means of bridging the gap between given tones; and, as will be noted in the sequel, the physical and psychical laws concerned in scale-evolution are such that different races of men have devised many different scales hitherto, and that others may perhaps come into use in the future.

On the contrary, instead of being products of necessity, musical scales are rather true works of art, involving nice discrimination and selection in their construction. Yet, like all artistic products, they may be subjected to scientific scrutiny, their actual constitution may be approximately tabulated, and the acoustic, physiological, and other influences that have moulded them discovered and described. To this investigation the eminent physicist, physiologist, and psychologist Helmholtz has devoted a large part of his famous treatise on "The Sensations of Tone" (*Die Lehre von den Tonempfindungen*). The object of the present article is to dissect out his theory of the subject from the somewhat intricate complex of discussion in

which the liberal method of his work involves it, and to exhibit its essential elements as concisely as possible.

The nature of the scales now in use among civilized nations is well known to all readers of works on musical theory. These scales are all comprised within an octave, and are composed of seven or twelve degrees separated by not very unequal intervals of relative pitch. These intervals are customarily characterized by the ratio subsisting between the vibration-numbers (vibrations per second) of their limiting tones. For convenience in reference, I subjoin a table of several of the commonest scales. In each case the upper line contains the ratios of the several notes to the first or "tonic," the next line the ratios between successive notes, and the lower lines the letters and vibration-numbers belonging to scales thus constituted when based on middle C of the piano, with an assumed pitch of 264 vibrations per second.

1.

1/1	9/8	5/4	4/3	3/2	5/3	15/8	2/1
	9/8	10/9	16/15	9/8	10/9	9/8	16/15
C	D	E	F	G	A	B	C′
264	297	330	352	396	440	495	528

2.

1/1	9/8	6/5	4/3	3/2	5/3	15/8	2/1
	9/8	16/15	10/9	9/8	10/9	9/8	16/15
C	D	E♭	F	G	A	B	C′
264	297	316.8	352	396	440	495	528

3.

1/1	9/8	6/5	4/3	3/2	8/5	16/9	2/1
	9/8	16/15	10/9	9/8	16/15	10/9	9/8
C	D	E♭	F	G	A♭	B♭	C′
264	297	316.8	352	396	422.4	469⅓	528

4.

1/1	9/8	6/5	4/3	3/2	8	15/8	2/1
	9/8	16/15	10/9	9/8	16/15	75/64	16/15
C	D	E♭	F	G	A♭	B	C′
264	297	316.8	352	396	422.4	495	528

5.

1	25	9	75	5	4	45	3	25	5	225	15	2
1	24	8	64	4	3	32	2	16	3	128	8	1
C	C♯	D	D♯	E	F	F♯	G	G♯	A	A♯	B	C′
264	275	297	309⅜	330	352	371¼	396	412½	440	464 1/16	495	528

6.

1	16	9	32	5	4	64	3	128	5	16	15	2
1	15	8	27	4	3	45	2	81	3	9	8	1
C	D♭	D	E♭	E	F	G♭	G	A♭	A	B♭	B	C′
264	281⅜	297	312⅝	330	352	375⅝	396	417 5/7	440	469⅛	495	528

7.

1	21/12	2⅛	2¼	2⅓	2 5/12	2½	2 7/12	2⅔	2¾	2⅞	2 11/12	2
1	1	1	1	1	1	1	1	1	1	1	1	1
C	C♯ / D♭	D	D♯ / E♭	E	F	F♯ / G♭	G	G♯ / A♭	A	A♯ / B♭	B	C′
264.	279.699	296.3298	313.9497	332.618	352.3956	373.349	395.558	419.079	443.997	470.397	498.367	528.

Number 1 is the theoretical major scale—the most important of all. Number 2 is the theoretical ascending minor; it differs from the preceding only in having a flat or minor third. Number 3, the theoretical descending minor, contains not only a minor third, but a minor sixth and seventh. Number 4 is a combination of 3 and 1, and is sometimes called the instrumental minor scale. It has a minor third and sixth, but a major seventh, and may be played either upward or downward. Numbers 5 and 6 are two of the large family of chromatic scales which have sprung from the desire to subdivide the longer intervals by the insertion of intercalary or "accidental" notes. Those here given will be seen to be derived from the major scale by the addition of five sharps in the one case, and of five flats in the other.

Other chromatic scales may be constructed from the minor scales by a similar harmonic treatment, or we may cast aside the principle of harmonic relation and simply *bisect* all the longer intervals. The results will again be slightly different.

It is not necessary, however, to prolong this list, for these scales are being more and more resigned to theoretical treatises, while the great army of piano and organ tuners, with the powerful aid of many violinists and vocalists, are establishing and making popular a compromise scale whose great recommendation is that it makes possible and easy a near approximation to the more complex transpositions from one key to another. It

is known as the Scale of Even Temperament, and consists of twelve equal semitones whose length is $\frac{\sqrt[12]{2}}{1}$. Number 7 in the above table gives the ratios and vibration-numbers thus obtained.

Comparison with the preceding theoretical scales, and with some others not given, reveals the remarkable fact that the tempered scale coincides at but *three* points with its theoretical companions; namely, at its two extremities—C and C′—and at its middle point—the F♯ or G♭ that *bisects* the interval between F and G. At other points its departures from them range from $\frac{3}{10}$ to $6\frac{6}{10}$ vibrations per second.

To these scales might be added a large number that are known to be used by peoples whose music has not attained the complexity of ours. For our present purpose we need mention but a few, all of which recognize the fundamentalness of the octave.

The popular melodies of the Scotch and Irish, so long as they remain uncontaminated by foreign influences, employ a scale of *five* tones. The Chinese, also, altho attempting a theoretical division similar to that of our tempered scale, are confined in practice to but *five* of the notes thus obtained. They content themselves, so to speak, with playing upon the black keys of their theoretical gamut. The fancy for similar scales of five tones prevails among many semi-civilized peoples.

The Indo-Germanic family in general carry this subdivision of the octave much further, our own systems being surpassed in this particular by those of our oriental cousins. The Arabs, for example, count *sixteen* or *seventeen* notes to the octave. The traditional scale of India contains *twenty-two* theoretical degrees, which practice combines in various ways into modes of seven. And the Persians are just twice as minute as we, extending their subdivision to quarter-tones, and thus obtaining *twenty-four* notes to the octave.

From a musical system recognizing small intervals in some such way as this it is supposed that the earliest music of the Greeks was derived; for Olympos, the first Greek theoretical musician of whom we have record, is said to have used a scale with extremely small intervals. Exactly what was the nature of the system of Olympos, however, is difficult to determine.

The first historic fact we have is that the early Greek scale was but four notes long. The strings of the lyre being tuned to these four tones, the whole scale was termed a "tetrachord." Different tetrachords appear to have been used by different branches of the Greek race, and thus to have acquired the appellations "Dorian," "Phrygian," and "Lydian." Euclid, in the third century before Christ, states that the difference between these lay in the order in which their long and short intervals succeeded one another. Reckoned from below upwards, this order was as follows:

Dorian, ⏑ — —, Hemitone, Tone, Tone.
Phrygian, — ⏑ —, Tone, Hemitone, Tone.
Lydian, — — ⏑, Tone, Tone, Hemitone.

Some such distinction as this doubtless obtained from very early times. It is curious that the length of the scales should have been fixed at a fourth. The recognition of the octave as the primary interval was due to the researches of Pythagoras in the sixth century B.C. Terpander, it is true, at least a hundred years before, is said to have stumbled upon a scale of seven notes, but with a desire to duplicate the tetrachord rather than to complete an octave. Pythagoras, on the other hand, after demonstrating the simplicity and intelligibility of the octave, fifth and fourth, proceeded to reconstruct the scale on definite principles. Taking the difference between a fourth and a fifth, or $\frac{9}{8}$, as his unit or "tone," he found that a tetrachord would contain two "tones" and about a half, thus:

$$\left(\frac{4}{3} \div \frac{9}{8}\right) \div \frac{9}{8} = \frac{256}{243},$$

and

$$\frac{256}{243} \times 1.0068 = \sqrt{\frac{9}{8}} = \text{a half-"tone."}$$

By tuning downward in fifths and thence back again in octaves, the same result was reached. This theoretical system of tuning met with some opposition, and we do not know how far it was adopted. Helmholtz finds it most satisfactory to restrict its successful application to the Dorian tetrachord, leaving the tun-

ing of the Phrygian and Lydian to be fixed upon other grounds. The octave, however, soon crept into all systems, altho without supplanting the traditional tetrachords. Thus, the famous Greek modes were originally octave scales constructed out of two tetrachords *plus* a Pythagorean "tone." The Dorian mode, for instance, consisted of two Dorian tetrachords cemented together by a "tone":

In later times these modes underwent considerable extension and modification, the nature of which changes is quite obscure and not necessary for us to discuss. How the Greek modes gradually merged in our modern scales is a subject to which we shall revert presently.

We have thus rapidly touched upon certain features in these various melodic systems, not only to emphasize the statement with which we began—that many different scales are now in use, and that our own are the products of a gradual development—but also to throw some light upon a few facts to which Helmholtz attaches particular significance.

Before passing on, however, to describe the theory of the choice of notes in forming a scale, we must pause a moment to consider the more fundamental problem, Why do we use any scales whatever?

The songs of all nations proclaim it a universal feeling that melodies, instead of performing their evolutions freely and continuously, must leap like acrobats from round to round of a *Tonleiter*, or scale. Yet it is obvious that in the nature of song there is no physical necessity compelling this disjointed progress; for not only can continuous melodies be produced upon the violin and monochord and any given progressive curve perfectly imitated upon them, but in the soughing of the wind and often in the songs of birds, in the cries of animals and in the inflections of human speech, melodic motion unmistakably asserts its independence of points of support or rest. Why, then, does *music* appear always fettered and constrained?

In attempting to answer this question it has been urged that a careful selection of suitable tones must be had before any harmonic structure can be reared, since harmony involves pre-

cise and obvious tone-relations; all contrapuntal composition necessitates the establishment by calculation of definitely related points through which the constituent parts or voices shall pass. It is also urged that melody can preserve no clear connection with a key-note unless its movements be restricted to tones perceptibly akin to that primary one.

These considerations, however, are irrelevant and must be scrupulously excluded. The problem is to discover how the taste for definite intervals arises in the absence of any conception of harmony or tonality.

Helmholtz lays much emphasis upon the great freedom of music in comparison with the other fine arts in respect of its material, and to this peculiarity attributes its tardy development as a fine art, since uncultured minds find it difficult to deal successfully with a language at once so unique and so perfectly plastic. Its very pliancy and incorporeity, however, fit it to picture with remarkable vividness the most delicate gradations of feeling, and thus in turn to generate similar emotional states in the hearer. In this power to imitate the flow of emotion itself instead of the circumstances that evoke emotion, music stands unrivalled.

This representative duty it usually performs through those successive variations in pitch which we term "melodic motions." It is a common tendency to regard the play of feeling as a kind of ethereal or spiritual *motion* within us inspired by external events. The movements of various mobile substances, such as flame from a wood-fire, smoke from a cigar, or water in its myriad manifestations as wave and cataract, brook and lake, serve to reproduce and typify to our minds the simplicity or involution, the smooth on-going or sudden arrest, the placidity or storminess of emotional conditions. In a similar way the multiform evolutions of melodies seem to us to express and evoke emotion, but to as much greater a degree than fire or smoke or water as sound is more immaterial than they, and as its production and compounding are more immediately under our control. The immense expansion of music as a fine art in modern times is largely due to the exactitude and intelligibility wherewith it can represent the highly complex emotional states induced by modern life and thought.

Through a train of reasoning like the foregoing, Helmholtz reaches the following conclusion: "We have seen, then, that melody has to express a motion in such a manner that the hearer can easily, clearly, and certainly appreciate the character of that motion by *immediate perception.* This is only possible when the steps of this motion, their rapidity and extent, are also exactly *measurable* by immediate perception. Melodic motion is change of pitch in time. To measure it perfectly, the length of time elapsed, and the distance between the pitches, must be measurable. This is possible for immediate audition only on condition that the alterations both in time and pitch should proceed by regular and determinate degrees."

"It may be objected," he adds, "that architecture in its arabesques . . . constantly employs curved lines and not lines broken into determinate lengths. But . . . the eye which contemplates arabesques can take in and compare all parts of the curved lines at once, and glance to and fro and return to its first contemplation. Hence, notwithstanding the continuous curvature of such lines, their paths are perfectly comprehensible. . . . The individual parts of a melody reach the ear in succession. We cannot perceive them all at once. We cannot observe backwards and forwards at pleasure. Hence for a clear and sure measurement of the change of pitch no means is left but progression by determinate degrees. . . . When the wind howls and its pitch rises and falls in insensible gradations . . . the whole phenomenon produces a confused, unpleasant impression. The musical scale is, as it were, the divided rod by which we measure progression in pitch as rhythm measures progression in time. . . .

"We consequently find the most complete agreement among all nations that use music at all . . . as to the separation of certain determinate degrees of tone from the possible mass of continuous gradations of sound. . . . But in selecting the particular degrees of pitch deviations of national taste become immediately apparent."

It would seem that throughout this discussion our author has exerted himself more to show why, even when we have learnt that it is not strictly necessary, we still cling to a determinate scale as a prerequisite for melody, than to discover how

definite intervals were characteristic of melody from its earliest youth. He consequently speaks of the expressiveness of music as if the elaborate melodies and involved emotions of to-day had always existed, and as if "determinate degrees" were merely a labor-saving contrivance for simplifying an over-complex artistic product. Yet *a priori* considerations and actual observations unite in asserting that primitive music neither assumes any great complexity nor is in any sense the outcome of overwrought emotion.

On the contrary, as Mr. Herbert Spencer has well explained in his "First Principles," music seems gradually to have unfolded its unlimited expressive powers through a process of slow improvement and integration of the rude stimuli of mere rhythmic noise. "Rhythm in speech," says Mr. Spencer, "rhythm in speech, . . . in sound, . . . in motion were in the beginning parts of the same thing. . . . Among various existing barbarous tribes we find them still united. The dances of savages are accompanied by some kind of monotonous chant, the clapping of hands, the striking of rude instruments; there are measured movements, measured words, and measured tones." And again: "As implied by the customs of still extant barbarous races, the first musical instruments were . . . percussive, . . . and were used simply to mark the time of the dance; and in this constant repetition of the same sound we see music in its most homogeneous form." Now, if we admit the probability that primitive singing is everywhere and always firmly interlocked with some kind of periodic movement or noise, is it not a natural inference that definite melodic intervals are the immediate fruits of this strongly rhythmic accompaniment rather than of any attempt to make emotional utterances intelligible to "immediate perception"? In other words, may we not justly suppose that precise and measurable variations in pitch are essentially accessory to the pulse of the dance or of the tom-tom orchestra, a more or less acute sound serving to lend a new accentuation to a point of stress, while at the same time lifting the whole performance out of a bare monotone and adding a new and easily extensible element of interest? The same statement holds good to some degree of music in its higher stages of development; for throughout the

history of music the rhythmic form is always the matrix wherein melodies are shaped and cast.

Many facts illustrative of this theory might be adduced from the data we have of barbarous music; and thus the intrinsic probability of the genius of melody from mere rhythm, as certified by collateral evidence drawn from the usages of extant savage peoples, leaves little doubt that the same process was gone through with among the ancestors of modern musical nations. If so, the discovery being once made that different tones may be successively combined to advantage, the independent expressiveness of melody may be supposed gradually to have asserted itself, taste and skill in its construction to have increased with the increase of knowledge and taste in other directions, certain intervals and certain co-ordinations of intervals to have been tolerated, others discountenanced, and thus in time a scale to have been established owing its *existence* to rhythmic tendencies and its *character* partly to natural acoustic facts and partly to national peculiarities of aural sensitiveness.

We have now penetrated to the second and perhaps more practical question, Why have certain intervals been preferred to others? Helmholtz has devoted much space to the answer, and we can do little more than offer a skeleton of his elaborate theory.

This theory has for its *Physical Basis* the great doctrine of partial tones whereof our author is the chief expounder.

Its *Physiological Basis* is the doctrine that the sensory mechanism of the ear is essentially a set of resonators, which are individually sensitive to and discriminative of certain stimuli, such as partial tones.

From these two doctrines is deduced a great fundamental law, that of *Tone-relationship* as influencing scale-production.

This law is of wide influence, but is limited in its action by two subsidiary elements which are more or less dependent upon race-differences in point of auditory refinement and general melodic taste. These limitations are, *first*, the smallest tolerable interval between two consecutive notes, and, *second*, the desire to secure uniformity or equality in the length of successive intervals.

The various possible combinations of these factors give us,

according to Helmholtz, the various scale-products of musical history.

Let us therefore examine them more in detail.

(*a*) The great topic in whose full development lies the value of Helmholtz's treatise is the compound nature of all musical sounds. As has now become well known, it is a demonstrable fact that with but few, and for the present unimportant, exceptions all sounds continuous and regular enough to be reckoned as musical tones are composed of many distinct tones bearing certain calculable ratios to one another. These component tones have been called "partials," naming the prime or basal note of the compound the first partial, the next higher the second partial, and so on. The different distribution and different relative intensity of the upper partials in a given tone determine its quality or *timbre*. The whole compound, however constituted, has been dubbed by the English followers of Helmholtz a "clang." The vibration-numbers of the partials of a clang, when all the possible partials are present, are proportional to the numbers 1, 2, 3, 4, 5, etc. The second partial is the octave of the first, the fourth of the second, and the eighth of the fourth. Above the eighth the partials lie so close together that they become very inharmonious with each other. For this reason pianos are usually so constructed as to suppress most of the partials above the sixth. Regarded merely as an instrument for producing musical tones, the human voice in singing is rich and full in the harmonious partials and, when skilfully used and spent upon vowel-sounds, comparatively feeble on the inharmonious ones.

(*b*) Turning now to the auditory apparatus, we find that the ear is thought to be essentially a graded set of some 3000 resonators, which are delicate enough to take the compound tone brought to them by the air and by the beautiful transmissive apparatus of the ear itself, and to analyze it into its elements. These elements can be recombined or kept separate in one or several perceptions.

We have then the physical fact that musical tones are compounded in a certain way, and the supposed physiological fact that the unaided ear can pull these compounds to pieces and direct its attention at will to any of the fragments.

(*c*) On these two facts hangs the law of selection according to tone-relationship, which is the formal statement of the familiar thought that we seek to associate together tones that seem akin to each other. The law of *relation* is: Two clangs are to be considered related in the first degree when they have an identical partial, and the nearness of the relation is proportionate to the loudness of that partial in each clang compared with the loudness of the other, unidentical partials; and two clangs are to be considered related in the second degree when both are in the first degree to a third clang.

Thus C (264 vibrations per second) and G (396) are related in the first degree because the third partial of C and the second of G are identical (792); C and A (440) also are in the first degree (but further removed from each other than C and G) because the fifth partial of C is identical with the third of A (1320). B (495), however, is in the second degree to C because both stand in the first degree to G, the fifth partial of G being identical with the fourth of B (1980).

The law of *selection* is: Within certain limits, in selecting tones to compose a scale we choose those most closely related to the tonic or starting-point.

It is now easy to see why the octave is the most universally recognized of intervals. It joins the nearest of kin to the tonic, and indeed bears a unique relation to the latter. This relation is described by Helmholtz thus: "Let any melody be executed on any instrument that has a good musical quality of tone, such as the human voice; the hearer must have heard not only the primes of the compound tones, but also their upper octaves, and less strongly the remaining upper partials. When, then, a higher voice afterwards executes the same melody an octave higher, *we hear again a part of what we heard before*—namely, the even partials of the former compound tones—and *at the same time we hear nothing that we have not previously heard.* . . . Hence the first and chief division of our scale is that into a series of octaves. In reference to both melody and harmony we assume tones of different octaves which bear the same name to have the same value, and in the sense intended and up to a certain point this assumption is correct." Imitation at the twelfth or at the double octave would possess the same peculiarity as imitation at

the octave, but is so rarely practicable that it has produced no tendency to subdivide our scale of possible tones into similar sections of more than eight notes in length.

Imitation at the next nearest intervals, the fifth and fourth, gives quite satisfactory results, but differs from that at the octave in introducing new partials. Notwithstanding this, the fifth and the fourth have sometimes played the *rôle* of the octave. For example, the Greek diazeutic tetrachords divided the whole range of possible notes into similar fifths; and in the early part of the middle ages it is said that melodies were sung by two voices in parallel fifths and fourths as now tenors and sopranos frequently sing together in parallel octaves. Imitation at the fifth and fourth still survives in the fugue and the sonata.

(*d*) Having pointed out the pre-eminence of the octave and the position of the fifth and fourth, let us now endeavor to trace the process of scale-formation according to the principle of tone-relationship. Beginning with any given note, and proceeding to add one by one its nearest kindred, we soon obtain a scale some of whose notes lie inconveniently near together and some inconveniently far apart. To avoid the crowding together of some of its notes, and at the same time to obtain a greater evenness in their distribution, we are then obliged to replace some of them by others more remotely related to the tonic. This is the practical effect of the first limitation—that of smallest tolerable interval.

The Mongols, the Malays, certain Polynesian, American, and African tribes, the Celts of Scotland and Ireland, together with perhaps the ancient Assyrians and Egyptians, avoid intervals less than $\frac{1}{9}$, which is between one sixth and one seventh of an octave. The Greeks ultimately agreed on $\frac{1}{15}$, or about one twelfth of an octave, as their limit; and modern music has gone but little further. The Arabs, Hindus, and Persians tolerate much shorter intervals than these.

It is obvious that the smaller the intervals tolerated the longer will the process of adding new relatives go on, and the more notes will there be to the octave. Thus the Chinese and Scotch may have five notes exclusive of the octave of the tonic; we may have twelve; and some Asiatics even as many as twenty-four.

Helmholtz adduces examples of five of the possible scales of five tones, as follows:

(1) c—d—⌣f—g—a—⌣c′, Chinese.
1 $\frac{9}{8}$ $\frac{4}{3}$ $\frac{3}{2}$ $\frac{5}{3}$ 2

(2) c—⌣e♭—f—g—⌣b♭—c′, Scotch (minor).
1 $\frac{6}{5}$ $\frac{4}{3}$ $\frac{3}{2}$ $\frac{16}{9}$ 2

(3) c—d—⌣f—g—⌣b♭—c′, Gaelic.
1 $\frac{9}{8}$ $\frac{4}{3}$ $\frac{3}{2}$ $\frac{16}{9}$ 2

(4) c—d—e—⌣g—a—⌣c′, Scotch (major).
1 $\frac{9}{8}$ $\frac{5}{4}$ $\frac{3}{2}$ $\frac{5}{3}$ 2

(5) c—⌣e♭—f—⌣a♭—b♭—c′, Scotch.
1 $\frac{6}{5}$ $\frac{4}{3}$ $\frac{8}{5}$ $\frac{16}{9}$ 2

Turning now to systems admitting shorter intervals than $\frac{10}{9}$, and especially to that of the Greeks, we find that they began by admitting the interval $\frac{25}{24}$, but soon restricted themselves to $\frac{16}{15}$. As they commenced with "octaves," so to speak, only a fourth long, we must first look at the combinations within that short compass.

Pythagoras, it was said, is supposed to have succeeded in applying his method of tuning by perfect fifths and octaves to the *Dorian* tetrachord with this result:

$$\frac{3}{4} \quad \frac{64}{81} \quad \frac{8}{9} \quad 1,$$
$$\frac{256}{243} \quad \frac{9}{8} \quad \frac{9}{8}$$

but Helmholtz thinks that the principle of tone-relation prevailed in the other tetrachords.

The examples that he gives are the following:

(1) The enharmonic tetrachord of Olympos,

$$\frac{3}{4} \quad \frac{4}{5} \quad \ldots \quad 1.$$
$$\frac{16}{15} \quad \frac{5}{4}$$

The attempt was even made to bisect the small interval between the lower notes, thus:

(2) The later enharmonic,

$$\frac{3}{4} \quad \frac{24}{31} \quad \frac{4}{5} \quad \ldots \quad 1$$
$$\frac{32}{31} \quad \frac{31}{30}$$
$$\frac{16}{15} \quad \frac{5}{4}$$

(3) The older chromatic tetrachord, described by Eratosthenes in the third century B.C.,

$$\frac{3}{4} \quad \underset{\frac{16}{15}}{\frac{4}{5}} \quad \underset{\frac{25}{24}}{\frac{5}{6}} \quad \underset{\frac{6}{5}}{1}.$$

The unevenness of this is obvious; a different measurement of the same intervals gives:

(4) The diatonic tetrachord, mentioned by Ptolemy in the second century A.D.,

$$\frac{3}{4} \quad \underset{\frac{16}{15}}{\frac{4}{5}} \quad \underset{\frac{9}{8}}{\frac{9}{10}} \quad \underset{\frac{10}{9}}{1}.$$

Here the second note from the top, represented by $\frac{9}{10}$, is only remotely related to the lowest note. A different tuning gives an improved relation by making the objectionable note a near relative, tho in the second degree, of the upper note, thus:

(5) $$\frac{3}{4} \quad \underset{\frac{16}{15}}{\frac{4}{5}} \quad \underset{\frac{10}{9}}{\frac{8}{9}} \quad \underset{\frac{9}{8}}{1}.$$

This is the tetrachord of Didymus, a grammarian of the Augustan age, to whom Ptolemy refers complimentarily.

The Phrygian tetrachord is supposed by Helmholtz to have had the form,

(6) $$\frac{3}{4} \quad \underset{\frac{10}{9}}{\frac{5}{6}} \quad \underset{\frac{27}{25}}{\frac{9}{10}} \quad \underset{\frac{10}{9}}{1};$$

and the Lydian,

(7) $$\frac{3}{4} \quad \underset{\frac{10}{9}}{\frac{5}{6}} \quad \underset{\frac{9}{8}}{\frac{15}{16}} \quad \underset{\frac{16}{15}}{1}.$$

"Two major thirds," taken from each end of the tetrachord, "would form a variety of the chromatic scale,

$$\frac{3}{4} \quad \underset{\frac{16}{15}}{\frac{4}{5}} \quad \underset{\frac{75}{64}}{\frac{15}{16}} \quad \underset{\frac{16}{15}}{1},$$

which does not seem to have been used."

At the end of this list Helmholtz remarks: "These are all the normal subdivisions of the tetrachord that have been used, but other subdivisions occur which the Greeks themselves termed *irrational* (ἄλογα), and we do not know with certainty how far

they were practically used." The soft diatonic mode, for example, contains the interval $\frac{7}{6}$, thus:

(8) $\frac{3}{4}$ $\frac{6}{8}\frac{3}{0}$ $\frac{7}{8}$ I
$\frac{2}{2}\frac{1}{0}$ $\frac{1}{9}\frac{0}{}$ $\frac{8}{7}$.
$\frac{7}{6}$

"The equal diatonic of Ptolemy contains a minor third divided as evenly as possible:"

(9) $\frac{3}{4}$ $\frac{9}{1}\frac{}{1}$ $\frac{9}{1}\frac{}{0}$ I
$\frac{1}{1}\frac{2}{1}$ $\frac{1}{1}\frac{1}{0}$ $\frac{1}{9}\frac{0}{}$.
$\frac{6}{5}$

But the Greeks were not slow to extend their tetrachords to octaves, and finally to a full double octave. From this grand scale of fifteen notes octaves beginning at different points were selected, and were named from the tetrachords concerned, Dorian, Phrygian, etc. Each of these "octave-forms" or "modes" was felt to have a peculiar character of its own, and the discussion of these characters seems to have formed the staple of antique musical criticism.

In the best period of Greek music there were seven modes, which when reduced by transposition to a common tonic would be as follows:

		Ecclesiastical Modes.
1. Lydian,	c d e f g a b c′—	"Ionic."
2. Ionic,	c d e f g a b♭ c′—	"Mixolydian."
3. Phrygian,	c d e♭ f g a b♭ c′—	"Doric."
4. Eolic,	c d e♭ f g a♭ b♭ c′—	"Eolic."
5. Doric,	c d♭ e♭ f g a♭ b♭ c′—	"Phrygian."
6. Mixolydian,	c d♭ e♭ f g♭ a♭ b♭ c′—	"Lydian."
7. Syntonolydian,	c d e f♯ g a b c′—	

In later times this system of modes was much altered in a way it is not necessary for us to consider here; for, in consequence of a reform initiated by Claudius Ptolemy of Alexandria, the church modes were derived directly from the ancient forms, altho under strangely interchanged titles (see above table). In the course of time these church modes coalesced into the two great modern scales.

Before passing to consider that coalescence, let us glance at the connection of the course of development we have just traced

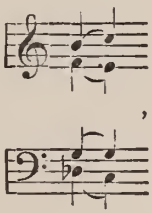
with the operation of our law of tone-relation. If we put that law to work, we obtain a graded list of related tones from which we may select several different series whose least interval shall be $\frac{16}{15}$; and if we then arrange these series in order of their average kinship with the tonic, we shall find the very scales just described at the top of the list. Hence the ancient modes and their direct descendants, the church modes, exemplify in a remarkable way the unconscious operation in the action of taste of the law of scale-construction whose formal statement we have given above.

The Arabic tonal system is somewhat more intricate than the Greek, but based on precisely the same principles. It is noteworthy, however, for its greater nicety of subdivision, for the skill with which it couples a system with perfect fifths with that of natural tone-relationship, and for its discovery of the ascending "leading-tone" of which we shall speak presently. Three of the twelve Arabic tonal modes coincide with three of the Greek, and several of the more prominent have what we call pure or natural intonation. It seems unnecessary to discuss the system at length, as it yields results not materially different from those obtained from the Greek, except perhaps in its more evident leaning towards pure intonation.

(*e*) Let us now turn to the subsidiary and restrictive law of selection which in its desire for equality and smoothness fixes its eye upon the length of the intervals involved rather than upon the kinship of the tones at their extremities. It may be thought that this principle should have preceded the other because its intervention may have been prior to that of the latter; yet there can hardly be any question that even if this be the order of time, it is not the true order of thought and explication. In its crudest stages music may indeed be more influenced by the principle of evenness, but as it emerges into systematic forms it comes at first almost exclusively under that of kinship.

The few points where traces of the action of the former principle are seen in the history of modern music are these. The oriental scales with their numerous notes are more or less under its power, altho their octaves, fifths, and fourths are derived as were the Greek. In Greek music it seems hardly to have appeared. The later enharmonic and the second "irrational"

tetrachords exhibit perhaps the only traces of its operation. In modern music, however, in proportion as polyphony and tonality—which is but the legitimate result of the tendencies induced by the fact of tone-relation—have developed, and the notes of the scale have thus acquired new bonds of union with each other and with the tonic, the freedom with which equality of interval has been sought has increased, until the interloper first, in certain of the chromatic scales, became the indispensable and powerful minister, and finally, in the scale of equal temperament, stands lord paramount.

One step in this process seems to Helmholtz to have been particularly important. Our taste having dictated that the so-called semitone, $\frac{16}{15}$, should be our smallest recognized interval, that fact served to give the semitone an independent definiteness and value. Now, the major seventh, or the note B of the major scale of C, which corresponds to the Greek Lydian mode, falls just a semitone below the octave of the tonic, and hence, altho naturally the most distantly connected to the latter of all the notes of the gamut, became with the fuller growth of tonality the most closely bound to it, and in the character of "leading tone" stepped into great prominence. The same function was performed in descending passages by the D♭ of the Dorian mode. The two "leading tones" occur together in the cadence[1]  , which Helmholtz calls "almost the only isolated and misunderstood remnant of the ancient tonal modes." The same phenomenon, as mentioned above, is to be found in Arab music, where several notes, lying quite close to their neighbors, act as routes to them.

To return now to the historic development of modern scales. The sudden elevation into power of the tone VII (B of the scale

[1] As in the last two bars of "And with his stripes we are healed," in the *Messiah* of Handel.

of C), backed by the influence of the spreading doctrines of tonality and of independent harmony, wrought the utter discomfiture of the other sevenths, the B♭'s, crowned "the wanton Lydian" mode chief of scales, transformed the Ionic into it by sharping its flat seventh, the Phrygian into the modern ascending minor, the Eolic into the descending minor, fused the Phrygian and Eolic into the instrumental minor, but, strange to say, left the famous Dorian almost entirely out in the cold.

During the fifteenth, sixteenth, and seventeenth centuries a strong feeling arose for the individuality of harmonic combinations or chords as such. This new agent in musical history seized the church modes, and, whatever may have been their tuning up to that time, established it thenceforward upon the basis of tone-relation. Wherever the antique tuning in its striving after perfect fifths had distorted the pure intonation, the error was rectified. Hence the great superiority of the modern major scale over every other is due partly to the fact that it lends itself with greater ease than any other to harmonic uses, and partly to the greater average connectedness of its constituent tones to each other; indeed, these two characteristics are at bottom but the two faces of the same thing. The minor scale possesses these excellences in a less degree and so occupies a subordinate place. The ancient modes owe their downfall to the small degree in which they possessed them. Nevertheless, while we have gained in harmonic, we have lost in melodic facilities, in the change from five or seven modes to two, and how to regain the old variety and power of expression without relinquishing the wealth that harmony has brought us is with many a question of great moment.

This brings us back to our starting-point and completes our hasty survey of Helmholtz's theory. The reader of his book cannot fail to be impressed with the close correspondence that appears between the historic facts and the theory offered, as well as with the excellent clearness and fulness with which the theory is advanced and illustrated. It is perhaps true that a strict mathematical interpretation of its terms develops a large number of theoretical scales that are as yet unknown in practical use, and that, since the actual forms often seem inferior in tonal correlation to the theoretical, a fuller explanation might

be welcome of the exclusion of the latter by the former. It is also true that Prof. Helmholtz seems to push too far his theory that we have no *harmonic* influences whatever to account for in the very early development of a scale, such as, for instance, a rude tuning of instruments by the simultaneous production of two notes. The Greeks knew of binary and ternary chords even if they were unable to employ them practically; several barbarous tribes of to-day not only know of such chords but have developed an elaborate polyphonic system of music; and it is in general probable that every people possessing any musical instruments have some notion of combining their tones in pairs and triads and even of tuning them by the resultant harmonies. The difficulty in this matter is of course that the simpler workings of harmonic influence and the influence of tone-relation as we have described it give precisely the same results, and it is absolutely impossible to say from mere inspection whether a given scale was moulded by the one or the other agency or by both. As soon as harmony becomes elaborate it begins to make a marked impression upon scales. To this influence are justly ascribed many of the later steps in the crystallization of modern scales out of the church modes, the whole of which process we were forced to compress into a single paragraph. Helmholtz will not admit any harmonic factor in the problem until that comparatively late period.

After making whatever small deductions are demanded by these seeming deficiencies, however, there remains a remarkable body of combined observation and speculation which challenges our heartiest admiration for its amount, its logical solidity, and its exceeding interest. To one who appreciates the care and ingenuity displayed throughout the whole treatment, it is surprising that Prof. Helmholtz's brilliant and triumphant grappling with an extraordinarily difficult problem has not been more widely published and recognized.

WALDO S. PRATT.

SOME DIFFICULTIES OF MODERN MATERIALISM.

ABOUT half a generation ago the leaders of advanced thought appeared in the philosophical and theological wilderness, announcing that the kingdom of science was at hand. Of course the way had to be prepared for the new kingdom by uprooting old views, and the aforesaid leaders were very efficient in this work. Armed with a logic variously described as rigorous, unsparing, relentless, etc., they pushed in all directions as effectually as the beast of Daniel's vision. They pointed out the incoherencies of received views so clearly as to make it plain that no honest man with the least ability could retain them longer. So well was this work done, that the bystander could hardly help thinking that nothing but mental dishonesty would explain the tenacity with which apparently intelligent persons clung to old beliefs. Indeed the prophets of the new era did not fail to hint with great plainness that the old views derived not a little support from unworthy motives. But this necessity of incessantly attacking and exploding old views has been a disadvantage to the new. The advanced thinkers have been so absorbed in attack and negation, as to give little attention to unfolding their own solution of the perennial problems of thought and life. As yet the new philosophy has not attained to proper self-knowledge, tho it can hardly be said to be lacking in self-consciousness; but it only vaguely perceives its own implications. One resulting evil is, that advanced thought does not succeed much better with logic than the unprogressive thought of the past. It is indeed logical enough in dealing with other systems; but it clings to the old theological method of instinct, compromise, and half-way measures in general, in adjusting itself to thought and life. This is doubtless due to its militant history. It cannot be that the brave men who have put to flight so many armies of theological and

illogical aliens in the name of logic are in the least afraid to follow logic whithersoever it may lead. They have simply had too much on their hands to attend to it. But the lack of this self-knowledge is a defect nevertheless. The chief demand upon advanced thinkers at present is that they leave the theologians for a time, and set their own house in the true order of logic. To help on this good work we propose to discuss the nature and difficulties of modern materialism, especially in its bearing on the problem of knowledge. By materialism we mean any doctrine which makes mind the product or result of organization.

But the simple statement that mind is the product of organization does not give a clear conception of materialism. Indeed the materialists themselves have hardly cleared up their own thought on this point. The difficulty is not merely to know how mind can be a product, but in what sense mind is a product. Of course it is not held that the elements create a substantial mind, but only that mind is the sum of mental states which are produced by organization. But the sense of this production is unclear. For a time the formula among materialists was, that the brain secretes thought as the liver secretes bile. This view regarded thought as a thing, and further overlooked the fact, that the secretory organs either separate from the blood what is already in it or make the products from materials contained in the blood. This view, then, would imply, either that thoughts pre-exist in the blood or that they are made out of blood. In either case, a very sharp eye would enable us to see them. This view of course was speedily abandoned, and the immateriality of thought was insisted upon. Most advanced thinkers would feel insulted if such gross notions were attributed to them; and one of the leaders has stigmatized them as "the materialism of the savage." Unfortunately they have succeeded better in telling what they do not believe than in telling what they do. Sundry nerve-centres are said to have the function of producing consciousness, just as other nerve-centres have other functions; but still the sense of this production is left unclear. As long as thought was viewed as material there was no absurdity in viewing it as a brain-product. The brain produces nothing, but merely modifies existing matter.

If, then, thought be a material combination, it is easy to

understand how it may be produced by the brain. There is no unlikeness between the antecedent and the consequent. The difficulty with this view is that it is nonsense, not that it is unintelligible. But when thought is viewed as immaterial, it is hard to understand the sense in which it is a product of material activities. The difficulty with this view is that it is unintelligible, and it may also be nonsense. The trouble here arises from the laws of energy and continuity. The conservation of energy demands that no energy shall be lost; and as nerves consume energy in performing their functions, thought must represent a certain amount of energy consumed in its production. If physical energy is spent in producing thought as thought, it must lay aside all its distinctive features and disappear in the mental realm. But in that case either physical energy would be lost or mental energy would be as real as physical energy. The physical realm would be in interaction with the mental realm, and thought, feeling, and volition would count in the course of events as well as the physical forces. It would even be possible in that case to view the mental side of matter as basal, and the physical side as appearance. Of course the materialist will not accept this view. For him the physical series is the abiding and independent fact. As such it is controlled only by the laws of force and motion. The thought-series is effect only, and never cause. But in order to make it effect only we must deny that physical energy is ever expended in producing thought as thought. It must be spent only in producing those physical states which have thoughts for their inner face; and these thoughts, as thoughts, must be powerless. They can affect the physical series not as thoughts, but only as having physical states for their outer face. Any other conception would bring us into collision with the conservation of energy; for under this law there can be no effect which is not reciprocally a cause.

These considerations have gradually led the more logical materialists to the following view: The physical series is self-contained and independent. It suffers no loss and no irruption. Both energy and continuity are absolutely conserved. Each physical antecedent is entirely exhausted in its physical consequent; and, conversely, each physical consequent

is fully explained by its physical antecedent. All physical movements are physically determined. The mental series is not properly caused by the physical series, but attends it. If the latter caused the former in the sense of expending energy upon it, either the continuity of the physical series would be broken, and energy would be lost, or thoughts would be as real as things. But the thought-series cannot be independent of the physical series, for that is contrary to the hypothesis. There is only one course left. We must view the mental series as the subjective shadow which attends the physical series. When, then, the physical series is of a certain kind and intensity, it has a mental side: but the reality, the energy, the ground of movement are entirely in the physical series. Physical energy is never spent in producing thought as thought, but in producing physical combinations which have a thought-face. Conversely thoughts count for nothing as thoughts, but only as represented in the physical series by physical states. Memory, reflection, and reasoning are only the mental side of changes in the brain. Mental movement of every sort is due not to any self-determination of reason, but to the nervous mechanism. A change of ideas means that the corresponding physical states have been displaced by others. This view has been elaborated at greatest length by Mr. Spencer in his "Principles of Psychology." He aims to show how all mental phenomena are but the inner side of molecular motion in the brain, or of what he calls nascent motor excitations. But the view is best expressed in the following quotations from Prof. Huxley's lecture "On the Hypothesis that Animals are Automata:"

"It may be assumed, then, that molecular changes in the brain are the causes of all the states of consciousness in brutes. Is there any evidence that these states of consciousness may, conversely, cause those molecular changes which give rise to muscular motions? I see no such evidence."

"It is quite true that to the best of my judgment the argumentation which applies to brutes holds equally good of men; and, therefore, that all states of consciousness in us as in them are immediately caused by molecular changes of the brain-substance. It seems to me that in men, as in brutes, there is no proof that any state of consciousness is the cause of any change in the motion of the matter of the organism. If these positions are well based, it follows that our mental conditions are simply the symbols in consciousness of the changes which take place automatically in

the organism; and that. to take an extreme illustration, the feeling we call volition is not the cause of a voluntary act, but the symbol of that state of the brain which is the immediate cause of that act."

It is easy to see how the materialist comes to this view. He must maintain the continuity and independence of the physical series. Hence he cannot allow that physical energy ever becomes anything else. Again, he cannot allow that the mental series has any energy or principle of movement in itself without making it as real as the physical series. Hence he is shut up to the view that the mental series is only a powerless attendant upon the physical series. But while it is easy to see how we come to this view, it is doubtful if its implications are fully understood even by the advanced thinkers themselves. If we observe the myriad movements of a great city, we are apt in uncritical moments to fancy that thought and purpose enter into them as originating and controlling. But now we know better. There is no ground for believing that any mental state can affect any physical state. The movements, then, are purely automatic; and tho we may believe that they are accompanied by thought and purpose, the thought is not the source of the movement, but only a sign that the movement is going on. In strictness there is very little ground for admitting the coexistence of thought with these movements; and it is very difficult also to tell for whom thought exists as a sign that nervous movements are going on. We may be tempted to say that the sign exists for the mind; but the mind is the sign. In strictness there are no advanced thinkers, but only advanced thoughts and feelings. The so-called thinker is but the sum of the advanced states. Again, we may suppose an advanced thinker preparing and delivering a lecture in support of the doctrine in question. Even the thinker himself, owing to the contagion of old views, would be likely to fancy that his thought and purpose count for something in the outcome. But this is plainly a mistake. To begin with, there is no advanced thinker; and if there were, he could only be a passive spectator of his mental states. The writing and reading of a lecture is purely a matter of physical movement; and we know at last that no mental state can affect any physical state. The preparation of the lecture may be attended by thought, tho that is doubtful;

but it certainly takes place without any intervention of thought. The thought, if present, is only the sign to nobody in particular that the nerves are doing the work; and if the nerves remained unchanged, they would do the work just as well if thought were entirely absent. On this point we have not the slightest doubt; and the doctrine enables us to understand many of the homilies from this quarter. It has long been a puzzle to the critical mind how any rational being could produce some things which have appeared among the clumps of advanced thoughts. But now we see that reason has nothing to do with their production; and the wonder rather becomes that the nerves should do so well.

But even yet we have no clear conception of the relation of the thought-series to the thing-series. Taken in earnest the theory in question reduces to pure magic. In physics under the law of conservation and correlation, there is no effect which does not in turn become a cause; and as by hypothesis thought as thought is never causal, it is never properly an effect. If we could look into a living brain, we should see the molecules in movement in various ways. This is the physical side and series. But some of these movements and combinations are said to have a subjective face. This is the mental side and series. This mental side, however, would not appear as such in the physical series. We should see, then, various combinations and movements of molecules. The movements may be conceived as spiral, elliptical, rectilinear, oscillatory, etc. When given groups of molecules are moving in one form, as an ellipse, they have no inner face; but when they are moving in some other form, say a spiral, they are attended by thoughts. No physical energy is drawn off to produce them; they are simply there. The spiral movement confines itself strictly to being a spiral movement, just as the elliptical movement confines itself to being an elliptical movement. Why, then, should the spiral movement be attended by thoughts while the elliptical movement is not? There is no answer except to say that it is the fact. There is no difficulty in understanding the generation of the spiral movement; but whence comes this new series? We get no hint of it by studying the spiral movement. The thought-series as such is simply and

purely magic. There is no ground for it in the physical series; and there is no mental subject to generate it as the result of its interaction with the physical series. Thoughts appear and disappear without any assignable reason whatever. It does not help us to assume a hidden mind-face to matter which is manifested only under certain conditions, say upon occasion of a spiral movement among the molecules; for it is plain that to be manifested at the proper time the mind-face must be acted upon by the physical face. Otherwise the mental manifestation might occur at any time, and in any form whatever. There must be something in the elliptical movement which represses mental manifestation; and there must be something in the spiral movement which elicits it. But this puts the origin of thought back of the spiral movement and in the hidden nature of matter. There is, then, a double movement in matter—a physical and a thought movement. But this leaves it doubtful whether matter as thinking, or matter as moving, is the true reality, or whether there may be something deeper than both. Either alternative is fatal to the assumed self-sufficiency of the physical series. Many materialists are inclined at this point to take refuge in the notion that the reality is deeper than both the physical and the mental series, but in so doing they fall into all the difficulties of Spinozism. The unknown reality, as having physical manifestations, contains no explanation of its mental manifestations. The latter must find their ground not in the physical series, but in the thought-nature of the true reality. But how comes the latter to have two sides? and how come these two sides to be parallel as thought and thing? Thus our monism vanishes into dualism; and thus the question escapes the materialist and disappears in the region of high metaphysics. Of course the materialist will not allow this, but will still insist upon the self-sufficiency of the physical series. In that case all our difficulties come back. We cannot allow the mental series to have any energy in itself, or to be in interaction with the physical series. We must always remember that there is no reason for believing that any mental state can affect any physical state; for the physical series goes along by itself. There is no double movement in matter, for by hypothesis the reality is entirely in the physical series. The thought-series appears as a magical

and groundless addition to various parts of the thing-series. Thus the same logic which brought us hither takes us farther. It is a break of continuity to assume that the thought-series can determine the thing-series. It is equally a break of continuity to assume that the thing-series can determine the thought-series as such. What, then, is the relation of the two? We cannot call it occasionalism, for occasionalism would imply a cause apart from the thing-series which adjusted the thought-series to it. It is occasionalism in the sense that the physical series does not produce thoughts, but occasions them; but as it occasions them without becoming them or expending energy upon them, the relation between the two series is that of pure magic. The materialist cannot admit the efficiency of thought as thought; hence he is shut up to affirming either the materiality of thought or a magical occasionalism. Either we must allow that certain molecular groupings are not merely attended by thoughts, but are thoughts, or we must take refuge in magic. The first view is intelligible, but nonsensical; the second view is not intelligible, and hence it is difficult to say whether it is nonsense or not. Thus we see that while the materialistic doctrine seems very clear, it is fundamentally unclear not merely in its possibility but primarily in its meaning.

Few materialists would accept this conclusion, owing to the little attention they have bestowed upon the problem. In particular they would repudiate occasionalism, even in its unmagical form, as a moth-eaten relic of metaphysics. But when it comes to telling in what sense thought is caused by matter, or how the impotence and immateriality of thought can be reconciled with the laws of continuity and conservation, they implicitly take refuge in a magical occasionalism. Every physical effect is a new condition of matter; and as thought is not matter in any condition, it is put outside of all physical effects. One distinguished writer upon the new philosophy assures us that no study of the physical series would give us any hint of the thought-series which attends it. The latter is always there when summoned; but it sits apart from the moving matter. This would be quite intelligible if there were a mind outside of the physical series, but it is quite magical on any other theory. When heat and light are "summoned," energy is always spent

in summoning them; but when thought as thought is summoned, it appears without any assignable ground, certainly without any expenditure of energy. One very popular attempt to escape this difficulty deserves mention, for it underlies all materialistic theories at this point. Thought is said to be a phenomenon of matter; and this formula is supposed to remove all difficulty. Phenomena are not caused, but simply appear. This suggestion does seem to help us a little until we remember that a phenomenon implies not only something which appears, but also a subject to which it appears. When, then, the thought-side of matter is said to be phenomenal, the question at once emerges, What is the subject and where the consciousness for which the phenomena exist? For the materialist there is no such subject. Yet so natural is the thought of self that we never divest ourselves of it even when denying it. When the materialist views the brain as a thinking machine, he always tacitly assumes himself as a reading machine which reads off the result. When we are told that nerve-motions have thoughts for their inner face, a self is always supplied for whom the thoughts exist. Materialistic statements tacitly assume back of the organism which conducts the mental processes a looker-on who tells off the processes and interprets their meaning. Thus thought is said to be a sign of nervous processes; but for whom does the sign exist? The outsider could not see the thought, but only the nerve-movements. For whom, then, is the thought a sign? For the thinking self, of course. Thus the self which the materialist labors to destroy, peers complacently through the very arguments which are framed for its destruction. Materialism succeeds in reducing the self to passivity so far as the physical world is concerned; but it remains throughout a critical spectator of the on-going. But this is a grave inconsistency. Materialism allows no self, and hence it cannot make thought phenomenal. The thought-series cannot be an appearance, for there is no one to whom it can appear. It cannot be a sign or symbol in consciousness only, for there is no one to read and interpret the sign, and consciousness itself is nothing apart from the sign. Thinking, then, as such must represent a real process in matter. But this also is contrary to the hypothesis. Matter does not think, but moves. Some of

these movements are said to have thoughts on the inside, but the moving matter is the only reality. Where, then, and how do the thoughts exist? They do not exist in mind, for the mind is but the sum of the thoughts. Nor do they exist in consciousness, for this is nothing apart from its objects. The conscious thoughts, then, must exist in matter itself. But this, too, is contrary to the hypothesis, for the physical series as such is supposed to be the only reality. Thus the mental series is supposed to be something external to the physical series, and hence external to reality. This is a grand embarrassment. It would seem that the physical series has its inner face not in itself but in consciousness. In itself the physical series is a redistribution of matter and motion, and it becomes more only in consciousness. But consciousness, again, is the inner face and not the place of its existence. Hence matter must have its inner face in itself. It would, too, be highly presumptuous on the part of consciousness to give reality any qualities which it does not have. Thought and consciousness, then, are real processes in matter. Thus we come around to the old possibility that matter as thinking and conscious may be the true reality, and that matter as moving is only an appearance. It is very hard to unravel this puzzle. If matter only moves, whence is thought? If it both moves and thinks, what becomes of the claim that all energy is in the physical series? If matter does not think, and if the mind is nothing, what does think? Perhaps it will be well to leave these problems to the materialists themselves. As yet they have given us no clear statement on these points. It would be a boon if they would state their doctrine so that it neither vanishes into magic nor identifies thought with material movements. We do not care to have the doctrine proved; but it would be well to have it clearly stated.

Thus far it has not been our purpose to dispute, but only to expound. We have not sought to disprove materialism, but only to find what it is. The materialist holds that thought is produced by organization; and it is interesting to know the sense of this production, and especially how the impotence and immateriality of thought can be either maintained or given up on materialistic premises. We pass next to discuss the bear-

ings of every form of materialism on the problem of knowledge. And first we point out that we reach the thing-series only through the thought-series. We know that there are things, and what they are, only through thought. Hence while the thing-series may be first and fundamental in the order of fact, in the order of knowledge the thought-series is first. A first question, then, would be, What warrant is there for affirming a thing-series at all? If the thought-series be so emaciated and helpless as the materialist teaches, why trust its reports about things in any case? Why may not the thing-series be after all only a phase of the thought-series? From Hume to Spencer, materialistic philosophers have defined the thing-series as a series of vivid states of consciousness; while the ego is a series of faint states of consciousness. But vivid or faint, this definition makes both subject and object states of consciousness, and hence both belong to the thought-series. Here is the place where materialism always tumbles into idealism, whenever it attempts to reason out a theory of perception. It is well known that Spencer at this point, when his theory was about to collapse into nihilism, saved himself by reinstating the ego as a true agent. The ego, from being a series of faint impressions or the inner side of nerve-movements, suddenly becomes a true source of energy; and the warrant for affirming a thing-series apart from the thought-series is found in the fact that our own energy is resisted by an energy not our own. This is excellent doctrine; but it does not agree with the other doctrine that the ego is only a sum of mental states, and that mental states affect no physical states; for it makes our own consciousness of effort and energy the turning point in the debate between idealism and realism. Upon the whole, we advise the materialist not to debate this point, but quietly and colossally to ignore it. It will be hard to get out of the debate either without falling into idealism or without admitting the real agency of the ego. Logic is a good thing, but in such a state of affairs it would be easy to get too much of it.

We pass this point and raise another. All arguments for the efficiency of matter assume that we have a valid knowledge of matter. That X is adequate or inadequate is a proposition which admits of no discussion. The thought-series, then, must

reproduce the thing-series, and it is of interest to know how this can be. The general notion that the latter determines the former in no way implies that the latter must determine the former so as to correspond to itself. If an organism be able to generate thoughts, it by no means follows that the thoughts must represent external objects. One would expect that the thoughts would represent, if anything, the organic processes of which they are the inner face; whereas they never refer to these, and commonly refer to things entirely apart from the organism. Nervous combinations and movements are said to have ideas for their mental face, and the natural thought would be that those ideas would be ideas of their peculiar nervous correlates. But this is never the case; indeed the current doctrines about those correlates are even now matters of not very cogent inference. This complete silence of the organism as to what is going on in itself, and the report instead of what is taking place in the outer world, are very remarkable facts. Certainly when matter is declared to be a double-faced entity, we expect to find the mental face reflecting that part of the physical face which is over against it; but the mental face never reflects the series which produces it, but other and unconnected series. Thus rays of light fall upon the body and a thought results, but not a thought of nerve-processes nor of vibrating ethers, but of an external luminous object. It is strange indeed, that anything should result, but that the thought should be of an object at many removes of mediated action, is surprising in a far higher degree. The wonder is still greater in our perception of others' thoughts. Here some waves of air fall upon the ear, and at once the nerves produce thoughts with the added assurance that they are the reproduction of a thought-series existing apart from our own. There is the additional wonder in the latter case that some nerves produce thoughts only in response to certain vibrations, and other nerves need different vibrations. The difference between a Frenchman and an Englishman is fundamentally a difference of nerves. We can now understand the problem. If knowledge is to be possible, the mental series must truly reproduce the physical series and all other mental series; but what ground is there for affirming that they must correspond? This particular problem has

not received the attention from materialists which it deserves. In general, they have never considered the problem of knowledge at all, but have taken the crude theories of common-sense for granted. But the problem is a real one and demands a solution. And for the materialist there is no solution except some debased form of the pre-established harmony. He must assume not only that matter can generate thoughts, but that it is shut up by its nature to the generation of thoughts which correspond to the outward fact. He must even assume that bodies are so related to their surroundings as to be under obligation to generate correct thoughts about things in general. We call this a debased form of the pre-established harmony, because it denies the pre-establishment which alone saves the doctrine from imbecility. Many materialists have taken refuge from this admission in agnosticism; but materialism will not unite with that view except as a dogmatic affirmation. The entire proof of materialism rests on the assumption that we have a valid knowledge of matter. The thought-series, then, must correspond to things; but why? The only answer is, that matter is such that in the main it must produce true thoughts; but this is simply to affirm the fact without giving any insight into its grounds. But this theory is far worse than Leibnitz's pre-established harmony. Leibnitz found some reason for the harmony in the fact of its pre-establishment, but the materialist has simply to assert it and leave it unexplained. Moreover his harmony is not such a harmony between thought and thing as between body and thing. As the materialist degrades the Cartesian occasionalism into magic, so he degrades the Leibnitzian pre-established harmony into an opaque and unintelligible fact. This is a rather sorry outcome for a system of reasoned truth. Instead of progress we have a remarkable case of reversion, or atavism, and also a somewhat striking illustration of the law that degradation is as possible as progress.

Still the problem has not been entirely unnoticed. Notably the Spencerian evolutionists have sought to account for the harmony in question by a theory framed from natural selection and heredity. According to this view there is no original need that matter should think rightly; but if any organism should think wrongly, it would soon collide with reality and perish. Right

thinking, therefore, is necessary to continued existence. Natural selection must tend to pick out the sound thinkers from the unsound; and by heredity their tendencies will be integrated and transmitted. The final result will be that thought will at last be adjusted to things, yet without any reference to an opaque and uncaused harmony.

The ingenuity of this view is wonderful; still more so is the uncritical faith which can receive it. For since thought has no effect on physical processes, it is hard to see what effect for good or evil thought can have. The survival of the organism is a purely physical matter with which, by hypothesis, thought has nothing to do. There seems to be here a trace of the antiquated notion of self-control, according to which our knowledge determines our course. In a system of freedom the theory would have application; but when thought is only the powerless shadow of reality, its misadjustment is insignificant. In this theory the destruction of the organism is not due to a maladjustment of thought, but to a maladjustment of the organism. Those organisms which perish are not those which think wrongly, but those which cannot maintain their equilibrium with the environment. But there is nothing in this which implies that those organisms which are in equilibrium with the environment must produce true thoughts of the environment. The crystal maintains itself against its surroundings by virtue of its physical structure; but it does not follow that, if a crystal should have thoughts, they must reflect the surroundings. But why should the same equilibrium imply more in the organism? Why must organisms which can physically maintain themselves think rightly about their surroundings? This they must do if knowledge is to have any validity; but it is hard to find any reason for it. We are forced either to abandon knowledge, or else to fall back again on a grotesque harmony between organisms and their surroundings, such that when they take to thinking they can but reflect their environment. But this is Leibnitz's theory of pre-established harmony in its most debased form. Leibnitz was not content to affirm the harmony between mind and its objects; he explained it by its pre-establishment. Materialism degrades it to a physical significance and leaves it unaccountable.

Again, it is very remarkable that the narrow range of the Spencerian principle should have been overlooked. If it were true, it would provide for valid thoughts only as they are related to survival; whereas the bulk of our thoughts have no bearing on survival. A mistake in our theory of double stars or in our solar physics would not be attended with any physical disaster. The true theory and the false theory are equally without significance for survival. And since this is the case with the mass of our alleged knowledge, the action of natural selection can never come into play to separate the true from the false. What warrant, then, have we for trusting the report of thought on these things? The unmitiated may be tempted to think that we reach these things by reasoning; but on this theory, reasoning itself is only a function of the nerves. It is but the subjective side of the nervous mechanism; and there is no assignable reason why the nerves should reason more accurately than they perceive. If reasoning were an independent mental activity, self-poised and self-verifying, the case would be different; but the mind is only the sum of mental phenomena, and these phenomena are called up and shifted by the nervous mechanism. Once more, then, what warrant is there for trusting our nerves? That they should produce thoughts about everything is very remarkable, but that these thoughts should represent the reality is in the highest degree surprising. The mental series which originally was the subjective face of sundry nervous movements turns out to be the inner face of all physical series or movements, with the one amazing exception of the physical series on which it depends. To retain our trust in knowledge we must make once more the assumption of a pre-established harmony in its worst form. Who would have expected to find the ghost of Leibnitz in a somewhat degraded state lurking among the ponderous phrases of the Spencerian philosophy!

Another difficulty with this theory of knowledge is that its appeal to heredity and experience is not clearly justified by the principles of the theory. It is well known that when materialism comes to psychology it always allies itself with empiricism and associationalism. Thus Mr. Spencer, when he had conducted the evolution of the universe up to the borders of the mind, attached the associational psychology to his system, and

thus mind was brought into line with all below it. He also apparently greatly increased the resources of associationalism by his doctrine of heredity, whereby a race-experience was exchanged for an individual experience. In this way the system gained time for its transformations. This is very clear in appearance, but rather confused in fact. In order to learn from experience, there must be something which learns; whereas on the materialistic theory the learner is the experience itself. We learn from experience by remembering the past and deducing principles for present and future guidance. But this is impossible where there is no rational subject which stands apart from the experience and draws inferences from it. Now according to materialism we do not have ideas, we are the ideas. And these ideas are not the product of some past experience, but are the outcome of the organism as it is. An organism made at first hand from the inorganic would have precisely the same ideas, feelings, recollections, and general insight. The only way, therefore, in which experience can affect our mental life is by modifying the organism; it can directly teach us nothing. Nor is it in any sense our mental experiences which modify the organism; these by hypothesis are powerless. And the mental manifestations of the organism are in no sense learned from experience, but are the expression of what the organism is. We may speak of a gradual development of the organism and a corresponding development of mental manifestation, but we cannot speak of experience in the philosophical sense of the word. The same considerations apply to heredity in a materialistic system. Experience cannot be inherited because no one has it, and there is no one to inherit it. We are the experience, and the experience is the outcome of the organism. The experience from which we are supposed to learn is of course mental experience, and this by hypothesis never reacts on the organism. From another standpoint, also, this alliance between empiricism and materialism appears as impossible. The elements from which the materialist builds everything are subject to fixed laws. In all their inorganic manifestations they manifest not their habits but their inner nature. Chemical affinity and molecular combination in general are not the outcome of experience, but of the nature of the atoms themselves. We should expect,

then, if the elements should ever rise to vital and mental manifestations, that these also would be fixed expressions of what the elements are; not something acquired and adventitious, but something inherent and essential. Indeed from this standpoint the notions of heredity and experience are grotesquely untenable. The elements have laws, not habits; and they neither have nor inherit experiences. Their combinations, also, must be of the same sort; and if it be absurd to speak of the complex molecule as forming habits and learning new forms of action, it is equally absurd to speak of organic molecules as so doing; for organic molecules are simply complex molecules, and the organism is only a group of complex molecules. It is, then, a grave inconsistency when materialism is joined to empiricism, according to which mental manifestation has no fixed and necessary laws, but is a pure product of experience. According to materialism, there is no need of experience for any depth of insight or even for any amount of memory. All that is needed in order to have a perfect insight into both present and past is that the appropriate organism be produced. Materialism, then, is compatible only with a high form of apriorism; and the laws of mind have as good right to be viewed as essential and inviolable as the laws of gravity and chemical affinity. Indeed materialists and evolutionists in general show a very imperfect appreciation of causation in their theories of life and mind. Beginning with fixed elements, the outcome must be fixed; and the fancy that mind may waver and be this or that contradicts the notion of law which is at the bottom of the system. The laws of mind must be fixed in the nature of matter. This is a somewhat bizarre and unexpected result, but it must be admitted. It is needless to point out that psychological empiricism when logical makes materialism as a reasoned system impossible. The union of the two must be regarded as a kind of philosophical adultery. And so we come around to our previous conclusion, that the materialistic theory of knowledge is that of an opaque harmony between the organism and the surrounding world.

We have already pointed out that natural selection, as a principle of belief, does not escape the admission of an uncaused harmony between the body and its environment; we have next

to refer to a peculiar difficulty which arises from the principle, if allowed to be valid. It follows directly from the doctrine, that no belief can become wide-spread which is contrary to reality; for maladjusted beliefs must lead to collision with the nature of things and consequent destruction. It further follows that every wide-spread and enduring belief must correspond to the nature of things. Certainly those beliefs which originated in the earliest times and which have maintained themselves ever since must be viewed as having far higher probability than the late opinions of a sect. The great catholic convictions of the race represent the sifting action of the universe from the beginning. They are therefore the only ones which, on the theory, can lay the slightest claim to our acceptance. It is, then, in the highest degree inconsistent when the disciples of this view reject a belief because it is old and reaches back to the infancy of the race; for this is the very characteristic of true beliefs. A belief which has only recently appeared can hardly lay any claim to be considered at all. What then shall we do with such beliefs as the belief in God, freedom, the spirituality and immortality of the soul, and the existence of a moral government in the universe? Of course as materialists we cannot accept them; but how can we as materialists reject them? The same brain which has ground out the truths of materialism has also ground out these other notions. That they are not fatally maladjusted to the nature of things is proved by their continued existence; and by hypothesis they are products of that natural selection whose special business is to sift the true from the false. There is nothing to do but to attempt a distinction between maladjusted thoughts which lead to destruction and others which do not. Our thoughts of God and supersensible things are of the nature of dreams. They lie outside of any possible physical experience; and hence they cannot collide with reality any more than with a ghost. Unfortunately it is not easy to draw this line so as to conserve those physical truths which lie outside of any possible experience, and at the same time put religious and other obnoxious ideas to flight. It is a very grave circumstance that matter should be so given to dream and error. Of course the uninitiated will think that reasoning will serve our purpose; but reasoning itself is a part of the nerve-process.

Throughout the past, natural selection has favored anti-materialistic views; in the future, the same process must eliminate materialism. It is plain that those beliefs which make most of the person and which give one most energy and hope must in the long-run have an advantage over others which are relatively discouraging and depressing. Hence in the end, beliefs which tend to righteousness and cheerfulness must overcome all beliefs which tend to looseness and despair. The former will tend to conserve the physical and moral health both of the person and of society; and the latter will be in alliance with destruction. If it be said that we here forget our previous assumption that a mental state cannot affect a physical state, we reply that that assumption is not our own but the theorist's. We do not assume any responsibility for any of these views; we inquire merely into their implications. And since the theorist has introduced natural selection as a determining principle of belief, we inquire whither it will carry us. That this principle does not agree with the other principle, that the physical series goes along by itself, is not our affair. And even if the two did agree, it would be highly unscientific to hold that a change of opinion will have no effect on action. As opinion, of course, it would be powerless, but as opinions are only the subjective sides of nervous states, it follows that a change of opinion points to a change in the nervous processes, and hence it must lead to change of action. Now as a matter of fact, the belief in God, immortality, and moral government has a great value both for personal and social well-being. It is the great source of courage, hope, cheerfulness, and steadfastness in righteousness. And on the other hand it is undoubted that materialism, atheism, etc., are relatively depressing and demoralizing. The rapid spread of pessimism among the more earnest of the advanced thinkers is sufficient proof of this. Hence, under the operation of natural selection, the former set of beliefs will have a decided advantage over the latter; and in the end they must conquer. That matter can form the conception of freedom, the soul, and God, we know by the fact; hence they are plainly not repugnant to the nature of matter. The direction which its future thinking must take under the influence of natural selection is plain. Matter must come at last to a firm faith in the soul, immortality and God.

Of course the eager objector, carried away by his nerves, urges that believing them would not make them true, but would leave them cherished delusions. It is odd how hard it is for one to master his own theory. By hypothesis matter is capable of valid thinking; and why should we not trust it when it thinks about God as well as when it thinks about the world? We do not insist that it is equally trustworthy; we only ask for some standard whereby one set of thoughts can be ruled out while another is retained. Of course we are beyond the point where we fancied that reason itself is such a standard; for reasoning itself is part of the nerve-processes. It does not contain any standard of truth in itself, but comes and goes according to the principles of nerve-mechanics.

This raises the further question how the materialist can speak of error at all. We have seen that to save knowledge he must fall back on the notion of a necessary harmony between mental action and its objects. But such a theory makes no provision for error. Like the pre-established harmony of Leibnitz, it is incompatible with the admission of error. The theory implies an exact and consistent report of all mental objects, whereas in fact we have the most confused and conflicting accounts. The question, How is error possible? is of the utmost speculative significance; and yet it has been almost entirely ignored in the history of speculation. If knowledge be determined by law, why is not the outcome necessary? And if reasoning be governed by the inviolable laws of thought, how is mistake possible? In order to put any trust in perception every school of thinkers must allow that the interaction of thought and organism must be fixed, so that a given physical excitation will have a definite and fixed mental reaction. But the results of this reaction, in turn, are under the control of fixed mental law. How, then, is error possible either in perception or in reasoning? But if error be as necessary as truth, what reason is there for distinguishing between them? No system of necessity can answer these questions so as to save knowledge. No system of metaphysical necessity is compatible with either science or philosophy. In every such system all beliefs are effects only and are fully explained by their antecedents. They are not deduced from grounds, but are produced by causes. A rational belief, on the

other hand, is one which has grounds as well as causes; and to discern its rationality we must have a standard of truth in the mind, and we must be able to apply it to our beliefs, and to accept or reject them accordingly. Freedom is necessary to reasoning. In a system of necessity all beliefs are *de facto* and none are *de jure;* or if this distinction should exist for an observer outside of the circle of necessity, we who are in the circle could never distinguish the *de facto* from the *de jure* in belief. For to do this we must be able to control our thoughts according to some law of truth, and this by hypothesis is impossible. And allowing it to be possible, we are still greatly embarrassed as materialists; for a great many conflicting and contradictory beliefs exist. Matter is engaged in producing a great variety of opinions on many important subjects; and it is interesting to know which are to be accepted. Probably the materialist would urge us to accept his views, and would give us his word of honor for their truth. Unfortunately words of honor have no value in logic, and we need something more. The most natural assumption would be that those views are most likely to be true which matter produces most freely; and hence we might test the truth by taking a vote. But sadly enough, the average brain is not so made as to grind out materialism or atheism. Matter in its thinking has a strong tendency toward theism and spiritual conceptions of things; and it has even devoted much attention in the past to metaphysics. Of course these views are false, but how are we to escape them unless the nerves take a new direction? If the human mind were something which is capable of free reflection and which develops variously according to its circumstances, we might account for much variation by the mental environment; but of course this is not the case. It is indifferent to a molecule where it is; and it ought to be indifferent to any complex of molecules. In particular, it is hard to see how the organism can be affected by its mental atmosphere. Prejudice and superstition might influence minds; but they do not seem adequate to influence material movements. Besides, if they could, they are themselves the outcome of material activity. If there be prejudice, superstition, and stupidity in the world, matter is to blame for it. It is matter that hath made both us and our opinions, and not we ourselves. If, then,

there could be any distinction between reason and unreason in this system we should be forced to allow that along with a little right thinking matter has done a vast deal of wrong thinking. It has an inherent tendency to irrationality and falsehood. It is the sole source of theologies, superstitions, and anthropomorphisms, as well as the sun-clear truths of advanced science. If we were persons with faculties which could be carelessly used or wilfully misused, these things might be laid to the charge of individual carelessness, or stupidity, or dishonesty; but as we are not such persons, all these things must be charged to matter itself. This conclusion remains if we call matter the unknowable, the mysterious one, or anything else which may strike our fancy. In every system of necessity we have to posit in being, along with reason, a strong tendency to unreason which throws discredit on all knowledge. According to the materialist himself, for one sound opinion matter has produced a myriad unsound and grotesque ones. But even yet we have no ground for distinguishing the rational from the irrational. In the old philosophy the distinction between rational and irrational belief is, that the former rests on grounds which justify it, while the latter is groundless. But the new philosophy cancels this distinction entirely, and reduces all beliefs to effects in us. It recognizes production only, and allows of no deduction. All our beliefs are explained by their causes, and none have any rational advantage over any other. The only distinction is of relative extent; and the only standard possible, unless we yield to pure ipsedixitism, is to take a vote, and view rational beliefs as those which are most wide spread and enduring.

Our nerves being in motion along this line, they next point out that the possibility of error can be reconciled with the validity of knowledge only in the fact of freedom. Error must be the outcome of carelessness and volition, if knowledge is to be saved. If it be a necessary consequence of being, knowledge is overturned. The question of freedom is commonly supposed to have only a moral bearing; and its significance for the theoretical reason is entirely overlooked. The utmost that is generally claimed is that if it be denied, moral distinctions vanish; we insist, in addition, that rationality also vanishes. Discussing the question entirely in the realm of duty has the disadvantage

also that questions of passion and interest are especially prominent in that field; and thus there is great room for talking of the strength of motives and of the necessary victory of the strongest. In this way both the subject and the debaters often become sadly confused; and hence it is of advantage to extend the debate into a different realm. Now the essential nature of freedom is not the power to act without a motive, but the ability to choose an end, or law, and to govern one's activities, mental and executive, accordingly. This government may take the form of guidance or of repression. The being who cannot do this is neither moral nor rational. A rational activity demands just such a power. The aim of reason is to bring the *de facto* order of mental experience into the *de jure* order of thought. The mental mechanism under the laws of association brings us mental states in any and every order just as experience furnishes them. As thus produced they are simple facts, and are all on the same plane of actuality. The distinction of true and false, rational and irrational, does not yet exist. This first emerges when the mind comes to transform the actual order of fact into the ideal order of thought; and to do this the mind must be free. To bring its experience into rational order, the mind must be able to test its thoughts, to compare, to retain or reject them as they agree or disagree with the inner law of reason. The mind must not accept thoughts as they are thrust into it, but must sit regnant over the mental mechanism of association, sifting, testing, and ordering its own course according to the law of reason. The mind makes reason its norm, searches in the chaos of sense for the rational and rejects the irrational; and only thus does it rise to true rationality. It is plain that a mind which could not do this would be totally untrustworthy. Its beliefs would sink down into mere facts and below the distinction of truth and error. And even if there be such a thing as truth, our ability to reach it depends entirely on our power to control the given in thought, to suspend judgment, to eliminate the irrational, and to transform the chaos of experience into the transparent order of reason. This does not mean, of course, that the mind can coerce the conclusion, but that to reach a sound conclusion it must be able to control and coerce its activities. On the materialistic theory, the mental state, or rather

the physical state, does coerce the conclusion; and thus the conclusion represents no truth of reason, but only the resultant of conflicting nervous movements. It is not properly a conclusion, but an effect of its causes. That these will be the same next time we do not know; and if thought be tolerably clear, a complete scepticism of reason must result. Oddly enough, the determinists generally allow such a self-control in reason. They grant a power of thinking twice and of suspending and postponing both judgment and action. They grant that tho the mind cannot coerce reason, yet sound thinking does not come of itself. The inviolable law of reason may be present in the mind, yet unless the mind accept it and make it the norm of its activity, the outcome is error and confusion. Hence the care and circumspection of the scientist and the true thinker. They give all diligence to have their facts established and their premises unambiguous. In particular, they are on their guard against the misleading influence of association which tends to put on a delusive appearance of rationality. Even the associationalist assumes a power over the associations, and an ability to criticise them according to the law of reason He interrupts the processes of association, tears apart their conjunctions, disputes the beliefs which they are said to have produced, and withholds his assent from various alleged intuitions on the ground of his criticism. But in such activity we have one of the purest examples of freedom; and in such freedom we have an absolute postulate of rationality. In order to reach truth, the mind must have a standard within itself, and it must also be self-controlling. The law of reason itself does not secure obedience. The mind must be able to choose the law and to govern itself accordingly. With this assumption of freedom we can explain error without overturning the trust of the mind in itself. Error is the outcome of a careless or wilful use of our freedom. Our faculties are made for truth, but by neglect or misuse they may lead to error. Without this assumption of freedom, truth and error are alike necessary and alike justified. There is no longer any standard of distinction; and one belief is as good as another as long as it lasts. The belief in the soul is a fact which things have produced in us. The belief in materialism is a fact of the same sort. Neither has any logical advantage over

the other. If it were possible to reason, to examine the grounds of each belief, to compare them with some inner standard of truth, and to accept or reject accordingly, it would be otherwise; but as it is, both are at once logically groundless and necessarily produced. We do not claim that these considerations prove the fact of freedom; but we do claim that whoever will follow them to their consequences will see that freedom and rationality stand or fall together. A common assertion of the advanced thoughts is that freedom would make science impossible. It is well, then, to set up the counter-claim that without freedom there could be neither philosophy nor science.

It is strange how old delusions haunt us. Throughout this paper we have assumed that a power of reasoning is possible, and that there is such a thing in thought as sound logic. Hence we have assumed to judge and criticise as if logic were still in existence. While we have allowed the nerves to be all, we have assumed to remain as a critical spectator of their performances. We have also treated the materialist as if he had power at least over his thinking; and we have urged him to rectify his views, as if that were possible. And all thinkers of every school make the same assumption. The advanced thinker complains of the conservative that he fails to draw the most obvious conclusions; and this failure is even made the ground now and then for righteous indignation at the cowardice or dishonesty thus displayed. On the other hand, the conservative complains of the advanced thinker that he has not the courage of his opinions, and often falls into grievous backsliding from the faith. All alike appeal unto logic, and all alike assume both the power and the duty of being logical. The materialist may have some doubt of others' power to reason, but he has not the slightest doubt concerning his own. But these appeals to logic are all illogical, and show that we are not fairly under the influence of the new views. It has doubtless been a surprise to all critical readers to find the materialist so loud in affirmation and so puzzle-headed in argument, so fierce in his demands for logic and so backward in furnishing it. Bully Bottom in his two moods is inevitably suggested. "I will roar you that it will do any man's heart good to hear me;" but fearing to frighten the ladies, he changes his mind and resolves, "I will roar you as

gently as any sucking dove; I will roar you an 'twere any nightingale." At times the advanced thinkers flirt with instinct and impulse in the old common-sense fashion; and once in a while they even go so far as to blaspheme logic and logical consequences. Especially do they turn a deaf ear to demands for consistency, and practise the old theological eclecticism. One professor, in the very lecture in which he proved that we are in all respects what the viscera and nerves make us, urged us to do the duty which lies next to us, as if an automaton could have duties. Our advanced teachers abound in moral exhortation. Many of their performances in this direction are as edifying as the old manuals of devotion. Assuming logic to be valid and logical reasoning to be possible, we feel insulted by such exhortation. We have a feeling that our teachers are poking fun at us. But all our trouble arises from the fancy that logical reasoning is still possible; and all our difficulties vanish when we abandon this pestilent heresy. Reasoning is only the inner side of a nerve-process. Consistency might be expected of free minds; but who would expect consistency of nerves? From this standpoint, the abiding wonder is not that the nerves reason badly now and then, but that they ever reason well. If, then, a clump of advanced thoughts fall into irrelevant and inconsistent moral exhortation, it only means that the nerves have wrought in that direction. If such a clump show a remarkable backwardness in drawing a conclusion, the reason is that the nerves are set in another way. The amiable commonplace, the mild religiosity, the occasional attacks of fierce morality, which are the chief components of an advanced thinker, are no indications of personal character, but represent only the droll ways of the nervous plexuses and their nascent motor excitations. Matter plays hide-and-seek with us, that is all. If the advanced thinker were a person and were free to think rationally, we should insist on logic; but as this is not the case, the nerves must be left to their own devices. Anything good which they may grind out is so much clear gain; their illogicality and frequent errors must be reckoned to the misery of being.

Looking, then, at the world-system with materialistic eyes, we see a perpetual and necessary kaleidoscopic process. Parts of this process are attended by thoughts partly true but mostly

false. By hypothesis all of those thoughts which collide with materialism are false. In particular, the notions of right and wrong and freedom and all religious beliefs are pure fictions, by hypothesis, of course. Throughout the world-process there is a strong and almost overwhelming tendency to dream and falsehood; and but for a few advanced thoughts, error would have reigned supreme. Sadly enough, also, whether these advanced thoughts shall hold their own depends in no way upon their truth, but upon the nerves. Beliefs too are seen to be changing. This fact in itself is insignificant, but it is important in its implications. Each belief is the inner side of a nervous state; and a change in one points to a change in the other. What direction the nervous states will take in the future is not clear. It is highly improbable that the evolution philosophy is itself the only philosophy which is exempt from the law of evolution. We must expect that sooner or later all things and opinions will pass, the evolution dogma among the rest. The outlook upon practice is equally suggestive. Hitherto action has been under the influence of those nervous states which have God, freedom, and righteousness for their inner face. It is not sure what it will be when they are displaced by opposite nervous states. History and experience are not without their suggestions; and theory points to a reversal of current principles of action. If it were simply a matter of opinion, it would be immaterial; but as it is a matter of profound changes in the nerves, a change of some kind must result. There is no telling what horrors the nerves may have in store. Of course in this language there is an implicit assumption of freedom, but it is in the language only. We expressly disclaim all power to order our thoughts, to criticise, to draw conclusions, or to resign ourselves to the inevitable.

Plainly this result logically cancels all further inquiry. If there were a mind able to grasp the theory and its consequences, it would declare that the mind can be only a passive spectator of the nervous unfolding. But of course there is no spectator, passive or otherwise. The advanced thinker himself vanishes into advanced thoughts. The nerves are all and in all. The preparation of this paper has been attended by some thoughts; but that thought at most was only the sign to

nobody that the nerves were at work. If, then, any advanced nerves should produce a feeling of miff at anything therein recorded, the nerves which produced this paper produce also the hope that the advanced nerves will supplement the miff by producing the soothing conviction that it is all a necessary nerve-process. Finally if any advanced thinker should escape from his nerves so as to become capable of logical reasoning, we request, as a great favor and as a duty to advanced science, that he show where the logic of these conclusions fails. We have learned by heart the various assurances that truth can do no harm. We fear also that this half-heartedness, this dallying with compromise, this sewing of the new cloth to the old garment, prevents us from reaping the fulness of blessing which advanced science has procured for us. Moreover it is bringing advanced science itself into discredit. When an advanced thinker begins to descant on duty, there are sundry advanced actors who say with Gretchen, tho by no means in her spirit, "That's about what the preacher says, only with rather different words." Then follow sundry brutal sneers about a chromo-religion. And the theologians, too, are beginning to take heart. A few years ago they were pretty thoroughly cowed, or at least bullied; but now that the advanced thinkers have been so illogical as to lay stress on duty and religious sentiment, they are bringing out their degrading dogmas with the old assurance. And it must be confessed that Christianity can outdo advanced science on the field of instinct and sentiment. Besides, we who have followed the prophets of the new dispensation out of the theological and illogical Egypt ought not to be left in the desert without manna and without sight of the promised land. Our nerves, however, will not stop without jotting down the remark that they are not able to produce much expectation in this direction, owing, of course, to the illogical ways of nerves in general and their nascent motor excitations. And even this will not satisfy them, but they must add that at present logic is not the strong point of advanced thinkers. They are sentimental, ethical, religious, and highly prejudiced; but they are not logical. So strong are their tendencies to worship that some of the stricter positivists have taken to mixed ancestor- and progeny-worship. Strauss and Clifford have urged us to worship

the Cosmos with the devotedness of the Christian in his worship; and the suggestion has been received with great favor. So fearful are they also of any contamination of selfishness that many of them will not hear of a future life lest the purity of moral action be sullied. All are full of the most engaging sentiments; but it would be of advantage to all concerned if they would for a time forego sentiment and cultivate logic. May the advanced nerves speedily take this direction!

BORDEN P. BOWNE.

ILLUSTRATIONS OF A LAW OF EVOLUTION OF THOUGHT.

IN reflecting on the history of the changes through which the scientific theories of some special phenomena of nature have successively passed, I have been led to the recognition of what I believe to be a law of development of thought on such special subjects. I wish now if possible to trace this law throughout the whole realm of thought and of human activity based thereon, and thus to show that it is a *general law* of the evolution of thought.

The special examples which I shall select in order to establish the law in the first instance, and before extending it, will be taken from the field of geological science, because I more constantly reflect upon these; but similar examples might be taken from any department of natural science. My object, then, more specifically stated, will be first to show the nature of the philosophic relation which exists between the earlier and the later and more perfect theories on these *special subjects* and the law which underlies this relation; second, to show that the same law controls the relation between the earlier and later general theories of the *great departments of science;* and finally, that the same law is traceable with more or less distinctness also in the general evolution of society and the progress of philosophic thought.

Many would doubtless prefer the reverse or deductive order of presentation. Many would first state the law and then illustrate and verify it by application to many subjects both general and special; but I prefer the order stated above. I prefer to proceed from the special to the general, because I believe the inductive order to be far more satisfactory and reliable, and also

because, as already stated, I have myself been led to the clear recognition of the law in this way. In what follows, and especially in the extension of the law beyond the domain of scientific thought, I must ask the reader's indulgence for whatever is fragmentary and incomplete. I do not assume, of course, to give a complete account of the law of evolution of thought, but only "*illustrations*" of that law. It must be evident that in so wide a field and on so profound a subject it is impossible to do more than touch lightly some most salient points—throw out some bare suggestions, in the hope that they may awaken responsive and fruitful thought in the minds of others; and if the philosophy contained in these suggestions be not wholly new, I believe it is presented at least from a different and an independent point of view.

Reflections like those now about to be presented are peculiarly congenial to the thoughtful student of geology, indeed almost force themselves upon his mind; for the fundamental idea of geology is evolution, and the subject of these reflections is the evolution of thought. As all along the track of the geological history of the earth are strewed the remains of extinct species—*dead* forms, yet not all dead, but many transmuted into higher *living* forms—so all along the track of human history are strewed the remains of extinct theories—*dead* thoughts, and yet not all dead, but many transmuted into higher *living forms of thought*. As in biology the study of living forms is indeed higher than the study of dead forms, but higher than either is the study of the evolution of the living from the dead; so in philosophy the study and knowledge of present forms of thought, of present theories, is indeed higher than the study of dead systems, but far higher and nobler than either is the study of the evolution of the present out of the past, of living thought out of dead thoughts.

Our first task, then, is to show the relation between extinct and living theories in the special subjects selected as examples —the difference in their spirit and methods, or (to carry out the simile already used) the difference in form and organization between the living and the dead. But first of all I must make one preliminary reflection, and ask the reader to bear it in mind.

In all theories there are two elements; all theories on all

subjects are the product of two factors, a *natural* and a human, the one derived from *without*, the other contributed from *within*. The same is true not only of theories, but of all rational thought. It is precisely this internal element which constitutes human thought as rational, which differentiates it from mere sense-perception of brutes. It is just this internal factor which makes the difference between the lack-lustre gaze of a ruminant and the intelligent observation of the scientist. The one sees in the light of the sun only, the other also in the higher light of thought. The two factors may be in different proportions in the thought-work of different men, or of the same man on different subjects; but there can no more be a science or a theory or a rational thought of any kind without both factors than there can be an area without both length and breadth. Bearing this fundamental truth in mind, let us now take examples of subjects our knowledge of which has passed through successive stages to a present condition of great perfection—subjects in which truer and more perfect theories have displaced more imperfect and therefore relatively false theories—and compare the manner and the spirit in which the two were formed.

I take as my first example the theories of *geyser-eruption*. We have had on this subject two very distinct successive theories; viz., those of Mackenzie and of Bunsen: the one theory now dead, the other still living. See, then, the difference in the spirit in which they were conceived and the methods by which they were built up. Mackenzie goes to Iceland, visits the Great Geyser, and sees the wonderful phenomenon of its eruption—this *one* striking fact and almost no other. How meagre the contribution of nature! He now goes back home and strives by reflection—i.e., deductively—to imagine how, by the known laws of physics, the thing must have occurred. He pictures to himself the subterranean cave with its inlets and its outlet suitably placed, its steam-chamber and the increasing tension of steam until the moment of eruption, etc. See how large and splendid the mental contribution in the common result! Bunsen, on the contrary, remained long, and examined carefully *all* the phenomena of *all* the springs in the vicinity. He traced the gradations between them, he analyzed their waters, he took the temperature of the water of the Great Geyser at all times up to the moment

of eruption and at all accessible depths. Thus he observes and ponders, curbing his impatience, and again observes and ponders, until only after an exhaustive study of all the facts he constructs, or rather he is *irresistibly led to*, his beautiful and satisfactory theory of eruption. See in this case how large the contribution of nature and the due relation between the external and internal factors in the common result. The first theory tries to show how the thing *ought to have* been done, *must have* been done, how only it *could have* been done; the second is content to find out how it *was* done.

Take another example: The singular form and fairy-like beauty of *atolls* have long excited the interest of navigators and tempted the speculative faculty of scientists. How are these fairy rings formed? First we have the "*crater theory*." On mere cursory observation of *one single* striking phenomenon—viz., the circular form and central lagoon (see the meagre contribution of nature!)—a complete theory of formation was constructed. A volcano was imagined with its crater reaching nearly but not quite to the surface of the sea. Corals, finding this circular volcanic bank, built upon it to the surface and formed thus a circular reef which was then beaten by waves into a ring-island surrounding the position of the crater. See the large contribution of the human mind! Darwin, on the contrary, made patient and exhaustive examination first of the phenomena of coral growth and their limiting conditions, then of all the phenomena of coral reefs and islands, their different kinds and the gradations between them, and finally upon this really exhaustive study of all the facts he constructed his now universally accepted "*subsidence theory*." See again the large contribution of nature and the subordinate character of the mental contribution, or rather the due relation of the one to the other!

Take still one more example, viz., the theories of the cause of *slaty cleavage*. We have here also two well-marked successive theories, viz., Sidgwick's and Sharpe's, strongly contrasted in spirit and in method. The former was based on *one single* striking phenomenon patent to the most careless observer, viz., the superficial resemblance of slaty to crystalline cleavage. On this *one* single fact not scientifically observed, but patent to the popular eye, Sidgwick skilfully constructed his really beautiful,

ingenious, and attractive theory, with its imagined electric currents arranging in definite way the ultimate particles of a plastic rock-mass, and thus producing planes of easy fracture in definite directions. See the small modicum of facts, the meagre contribution of nature, and the splendid results of thought or, if you please, of genius! On the contrary, how different the spirit and the method of Sharpe's investigations continued by Sorby and Tyndall! Here we have the true spirit and method of cautious induction. Fact was added to fact, the final conclusion meanwhile withheld, but the mind ever active in pondering, testing, and verifying; again observation heaped upon observation, the mental process of pondering, verifying, and testing by experiment continuing until a well-nigh perfect "*pressure theory*" was the result. See the large contribution of nature in the combined result!

Thus the proposition previously announced becomes now still more evident. In every theory, in every thought-work of any kind, there are necessarily two elements, the natural or external and the human or internal. Nature furnishes the material, the human mind constructs the edifice. But the relative proportion of the two elements may vary infinitely. In earlier and more ambitious theories the contribution of nature is small, while that of the mind is correspondingly large; in more cautious induction, on the contrary, there is a just and equal proportion between the two. The results in the one case, therefore, are like beautiful castles in the air built of thinnest cloud-material—golden cloud-castles glistening in the early dawn of thought, but vanishing before the full light of day; in the other case like solid castles slowly built on the firm ground, wholly out of substantial materials taken from the quarry of nature, but shaped, laid, and cemented into a consistent artistic edifice by the constructive power of thought. Or to use another illustration: the one result is like gossamer web spun of the flimsiest material, delighting the eye with its intricate pattern and delicate beauty, glittering with dew in the morning sun, but quickly brushed aside from the busy path of progress; the other a substantial fabric closely woven of warp and woof, the warp being the laws of thought, the woof, or filling, the abundant materials furnished by observation of nature.

Thus in the progress of knowledge in all the subjects thus far mentioned we find, more or less marked, two stages of rational embodiment; i.e., two distinct theories, the one provisional, the other permanent; the one may be called an *hypothesis*, the other a true *theory*. In the subject of geyser-eruption Mackenzie's is the provisional hypothesis and Bunsen's the permanent theory; in the subject of coral reefs the "crater theory" is the provisional and the "subsidence theory" the permanent; in the subject of slaty cleavage Sidgwick's "crystalline theory" is the provisional and Sharpe's "pressure theory" the permanent. We have selected these among many others because the two stages are well marked and without the intermediate stages which obscure the law. In some other cases there are many successive steps, and therefore the law, tho still observable, is less evident. Thus in the difficult subject of *glacial motion* there are many successive theories, but De Saussure's, Agassiz's, and Moseley's may be classed in the first category of provisional guesses, while Forbes', Tyndall's, and Croll's fall into the second category of more or less perfect inductive theories. As a general rule, tho not always, in proportion as a subject is more complex there will be more successive steps, the evolution will be more gradual. I might multiply illustrations of the law by examples taken from every department of science, but this seems unnecessary.

Generality of the Law in the domain of Science. But if this be indeed a true law, we ought to find it not only in the progress of evolution of each special subject, but also in the general progress of scientific knowledge. The law of the part must be also the law of the whole; if we find it in the development of special scientific problems, we ought to find it also in the general progress of the great departments of science. Now we do indeed so find it. In astronomy it is well marked; for we have here first the geocentric theory of the solar system, the provisional, and the heliocentric theory, the permanent. In optics we have first the corpuscular and then the undulatory theory of light. In botany (another excellent example) we have first the Linnæan or artificial system of classification, and then the natural system of classification of plants. In each of these cases it would be easy to show that the spirit and the method of the earlier and the later theories differ precisely in the manner already pointed out.

But this fact will come out more clearly under our next proposition. We may therefore at once generalize the law as a great law of progress in all scientific knowledge.

Logical Necessity of the Law. There is a deep reason—nay, a necessity—for this law founded in the very finiteness of the human mind and the conditions under which it finds itself. See, then, the conditions under which the human mind finds itself on this earth of ours! Its scientific mission—the scientific work appointed for it to do—is to construct a true theory of the cosmos and of each special problem of nature. But on the one hand it is impossible to construct a truly scientific theory except upon the basis of a multitude of scientifically observed facts; on the other hand it is impossible to make a scientific observation except in the thought-light of a previous theory; for, as we have already seen, this is just the difference between intelligent human observation and the sense-impressions of animals—as already pointed out, animals see in the light of the sun only, man also in the higher light of thought. You see, then, the dilemma. To state it concisely: A true theory is impossible without a basis of scientific observation, but scientific observation is impossible without a previous theory. How, then, did we, how do we now, emerge from this dilemma? In the only way possible. *We make a guess.* Upon a few obvious, popularly (not scientifically) observed facts—facts forced upon our attention, not voluntarily and thoughtfully observed—we construct a crude provisional hypothesis. By this hypothesis the mind is aroused from its animal slumber into scientific activity. In the light of this hypothesis true scientific observation becomes possible and therefore commences; and finally on the scientific observations thus made possible and thenceforward accumulated is based a true and permanent theory.[1]

[1] In the preceding pages in order to avoid circumlocution I have often seemed to contrast the two theories on a given subject as if they were related to each other as false and true. But this is not strictly correct. They are really related as less true and more true, or as less perfect and more perfect. Theories which have been of any service in the progress of knowledge have always an element of truth in them. For example, the geocentric theory of the solar system explained many phenomena, and was true from the earth as a point of view. The heliocentric theory is far truer—explains a far greater number of phenomena, because it takes a more general point of view; viz., the centre of our solar system. This is probably

But both the necessity of the law and the relation of the provisional guess to the true scientific theory will be made plainer by an example. We take for this purpose the science of botany, because the steps in this case are so well marked and the reason of the law so clear. The prime problem proposed for solution in this science is a true and perfect classification; i.e., an arrangement of all plants in such wise that the position of each kind shall express perfectly its natural affinities or its degrees of blood-kinship to every other kind. But on the one hand this is impossible without complete knowledge, by scientific observation, of the structure and physiology of all kinds of plants; while on the other hand such scientific observation and therefore such knowledge is equally impossible without the help of a previous classification; for the prodigious abundance and variety of materials presented by nature is simply bewildering without arrangement —is utterly unmanageable unless simplified by classification. Thus a true classification is impossible without large scientific knowledge of the forms, structure, and physiology of all plants, but such knowledge is impossible without the help of a previous classification of some sort. We see the dilemma. How is it solved? In the only way it could have been solved. A *provisional classification* is first made on the most obvious and superficial characters—it may be on size, or on color of flowers, or on number of stamens—anything to arrange and simplify materials —a classification designed not to express natural affinities but to simplify material, not as an *expression* of knowledge, but as the *condition* of knowledge; in a word, not a scientific but an *artificial* classification. By such classification the materials become manageable; in the thought-light of such classification scientific observation becomes possible. Fortunately the artificial classification of Linnæus was remarkable for its simplicity and beauty. It was a masterpiece of art—a true work of genius, creating order out of chaos and bringing light out of darkness. Under the boundless enthusiasm it excited, thousands of botanists in

the truest we can ever make; but a still truer theory would be one which explained phenomena from the centre of our galaxy as a point of view. And an absolutely true theory would be one which explained all phenomena from the point of view of the centre of the cosmos. This absolutely perfect truth is of course unattainable to us. It belongs to God alone.

all parts of the world worked together as a grand army in collecting, observing, and comparing. A body of scientifically observed facts thus grew up and increased until it was ready to be vitalized by a true and natural classification. This natural classification, commenced by Jussieu, has continued to improve in form and increase in beauty to the present time.

Observe, then, the entire difference between the two kinds of classification both in character and in significance. In character they are different. The one is artificial, and like all artificial things—like all works of art—it is comparatively, and may be even splendidly, perfect from the first; as a piece of thought-work it may produce in the mind of the beholder a high intellectual delight; but, also like all artificial things, it is *rigid*—it cannot grow, it cannot change—and therefore, since knowledge ever grows, it must of necessity be temporary and provisional. The other is *natural*, and like all natural things it is imperfect at first, and may be even unsightly, because it is only the embodiment of imperfect knowledge; but also like all things natural it is *plastic*, ever growing, changing, yielding to the pressure of growing knowledge, and therefore ever increasing in beauty of form and symmetry of proportion. In significance also they are different. The one, in proportion as it is artificial, is only the *agent* and necessary *condition* of scientific knowledge; the other, in proportion as it is natural, is the *compendious expression*, the *rational embodiment* of scientific knowledge.

Universality of the Law. We have used the case of botany because it is perhaps the best and simplest illustration—because the earlier artificial or purely human theory was so beautiful and perfect that it was given up with reluctance for the more imperfect and at first more unsightly natural theory, and yet was so obviously artificial that its significance as the agent and condition of science is now evident. The two stages therefore are quite distinct, and pass from one to the other without intermediate gradations. Perhaps the case of astronomy, with its geocentric and heliocentric theories of the solar system, would have been an equally good illustration. The two stages are here also well marked, and the significance of the one as agent and condition, and of the other as rational embodiment of knowledge, is obvious. But the same law may be traced with

more or less distinctness in all departments of science and in every subordinate problem attacked by science. It is therefore general for scientific progress. But further the same law may be seen in the progress of *society*, in the progress of *art*, and in the general progress of *philosophic thought*. So that it may be regarded as universal and deeply rooted in the very nature and limitations of the human mind. We will now, therefore, proceed to illustrate it under the three heads just mentioned.

Society. Man is placed here on our earth, and the problem given him to solve—the work appointed him to do—is the final realization in each individual of the ideal, the attainment in each man of perfect intellectual and moral culture. But see again the dilemma! On the one hand, he cannot attain such culture or realize such ideal except through a perfect, i.e., a rational and natural, organization of society; on the other hand, such rational and perfect organization of society is the last result of perfect culture. How then shall he emerge from this dilemma? Evidently only in one way. He must construct a provisional social organization of some kind—it matters not what—an artificial classification of some kind, as the necessary condition of culture. It may be based on physical strength, or on conquest, or on birth, or on wealth, or on color—in short, on anything, however unnatural, irrational, or even absurd—any kind is better than none. Under the shelter, the fostering protection of such artificial and therefore provisional classification or organization of society, culture becomes possible and grows apace and has continued to grow until only *now* the cultured human reason is turned at last upon the problem of a natural and rational organization of society, and imperfect blundering attempts are beginning to be made to realize such an organization. See again the difference in character and significance between the two. The one is the necessary antecedent condition and the agent of culture; the other will be, when completed, the natural embodiment, the perfect expression of a perfected humanity. Again the one is artificial, and therefore comparatively perfect of its kind, but also rigid and unyielding, and therefore, since humanity ever grows, must of necessity be temporary and provisional; the other is natural and at first imperfect, but plastic, ever growing, changing, yielding to the pressure of a growing humanity, ever

increasing in beauty of form until it finally becomes a fit expression of a perfected humanity.

To illustrate: Man is, as it were, placed here on this earth houseless and homeless, and his work is to build him a house which shall be a fit emblem of his perfected or ideal nature—a structure which shall be not only a house in which to dwell, but also a fit temple wherein to worship God. But, on the one hand, what can he know of the principles of this glorious architecture? It is the last result of his perfected reason. On the other hand, how shall he improve reason unless he have a house to shelter him—a school-house wherein his reason may be disciplined and strengthened? What can he do? Only one thing. He hastily constructs a temporary building in which to live while he slowly from generation to generation grows in strength and skill and gathers materials for the future and more glorious temple. The first may be a restraint, often a tyrannous restraint, but is the necessary condition of social life, and therefore of the growth of humanity; the second when completed will be the beautiful expression, the glorious embodiment of our perfected nature, no longer restrained, but devoted to enjoyment and worship. But alas! our lot just now seems to have fallen on evil days. We are even now in an almost helpless transition state. We have torn down the old building associated in our minds only with oppression and restraint, but have not yet constructed nor even yet understood the principles of the construction of the more glorious new. Meanwhile we are scattered abroad gathering materials and living in shanties. But let us not despair. The materials are slowly gathering—the construction will surely commence.

Art. No department of human activity shows the law more clearly than the *useful arts*. All art is at first empirical, i.e., the result of more or less *blind* trials and the successive survival of the best results. Yet such trials are not wholly blind, but always more or less directed by a dim *intuitive perception* of nature's laws—an instinct, an unformulated inherited wisdom. Such art, tho on a far higher plane, is yet in some sense similar to the constructive art of lower animals. Under the guidance of such intuitive wisdom directing trial, art may reach a high degree of perfection, but sooner or later, on a lower or higher plane, its

growth is arrested, and it becomes traditional, and finally petrifies or decays. But if under the fostering influence of art the self-conscious reason becomes developed and begins to study the principles of art, i.e., the laws and forces of nature involved in art—in other words, if science should arise and be applied to art—then is the latter thereby impregnated with a new germinal principle which confers on it immortal life and eternal growth. Thus there are two kinds of art, viz., the empirical and the rational or scientific. The one is temporary and limited, the other permanent and indefinitely progressive. The one is the necessary condition and agent of scientific culture, the other is the perfect expression and the embodiment of the degree of scientific culture attained. Thus science is born of art, but turns again and perfects art. Science is the daughter of art—celestial daughter of an earthly mother—but when sufficiently grown turns again to help and glorify and confer immortality on her earthly mother.

But it is evident that in passing from the empiric to the scientific stage it often happens that imperfect science attempts to guide an already highly developed art. In such transition state art may be even injured by the hasty and too confident application of science; for the accumulated results of experience may be better than the reasonings of an imperfect science. But this is only a transition state. In the end science always perfects art, and conversely art is indefinitely progressive only through science.

Now social organization may be regarded as an art, the highest of all arts. This art also was of necessity at first empirical, and indeed is so even until now. We are only now trying to understand the rational principles of this art. We are only now trying to lay the basis of a science of society. We are even now in a transition state in which imperfect reason is interfering with the truer and better results of accumulated experience, and the art of social organization is likely to suffer. But when we understand fully the principles of social organization and the laws of social progress—in other words, when sociology becomes a true science—then this science will build the social structure on rational principles, and the art of social organization will have entered upon the scientific stage, and will thenceforward become

indefinitely and steadily progressive. But until then steady progress is not assured.

General Progress of Thought. Finally the same law is seen in the general progress of thought as exhibited by the development of scientific method. There has been much dispute and contrariety of opinion in regard to the relative value and mutual relations of Aristotelian and Baconian Induction. Some have held that there is no difference between them; others that the difference is just the difference between error and truth; while still others hold that there is nothing new or valuable in either of them. This last is the view of Macaulay in his brilliant essay on Bacon. According to Macaulay all men in all ages have practised inductive reasoning, and that without the aid of either Aristotle or Bacon; all a logician's rules teach him but to *name* his tools, not to *use* them. This view, like many others of the same author, is far more specious than profound. As already explained, in all departments art precedes science; but the study of science is not therefore useless. We walk before we understand the principles of centre of gravity: must we therefore not study the laws of equilibrium? We use wedges and handspikes without understanding the principles of inclined planes and levers: is it therefore unnecessary to study mechanics? Pottery and agriculture were successfully practised from early times: must we therefore neglect to study the science of chemistry? The art of healing has been practised from the dawn of civilization: must we therefore despise the science of physiology? Art indeed precedes science, but science turns again and perfects art. Altho therefore the art of inductive reasoning has always been practised, yet a recognition of the laws of induction is necessary for its highest perfection. Like all arts, the art of the discovery of truth by induction is at first empirical. Guided only by the intuitive reason, it may be even eminently successful in the hands of genius. But only a very limited knowledge of nature is thus possible. In order that science or the rational knowledge of nature should indefinitely increase, the laws of scientific method must be understood. The mind may indeed discover truth by intuitive methods which it seeks not to analyze, but this is the prerogative of genius; it cannot be communicated nor its results accumulated from age to age. It is only when the methods of

attaining truth are analyzed and reduced to formal rules which may be communicated—in other words, when the science of scientific method arises—that the rational and systematic knowledge of nature becomes indefinitely progressive.

The other two views may be dealt with together, as they are opposite extremes between which must be sought the true philosophy. To state them again: the one holds that Bacon brought forward nothing new or valuable, for his method of induction differs in no essential respect from that of Aristotle; the other, on the contrary, holds that the method of Aristotle is utterly exploded and that of Bacon has taken its place—that the one is a false, the other a true method. It has been supposed that these three views exhaust the possibilities of the case. But not so. There is still another view which combines and reconciles the two extremes—which explains their differences by transcending them—the true test of philosophy. The bare statement of this truer view is sufficient to show the fallacy of all others.

The fact is, we have in this case an admirable example of the law of development of thought which we have been illustrating. Aristotle's method of induction is provisional; Bacon's permanent, but ever growing. Aristotle's was conceived (as indeed was and must have been all scientific theory of that time) in the spirit of hypotheses; Bacon's in the true spirit of cautious induction. Aristotle's was the necessary condition and agent of scientific progress; Bacon's the expression, the embodiment of scientific thought as well as the agent of farther progress. By Aristotle's method, from a few obvious facts popularly observed we *leap* at once to the highest generalizations, wholly neglecting to verify the intermediate steps; by Bacon's method we *creep* slowly from point to point, verifying as we go, thus making sure of everything passed over, and using it as a solid basis for farther construction. Thus by the successive use of the opposite processes of inductive generalization and deductive verification we slowly construct a solid and permanent work, ever building, never finished. Both are inductive work, but one is rapid guess-work, the other cautious and solid mental construction. Of the two factors in all thought-work, viz., the natural and the mental—the external and the internal—in the one the internal vastly pre-

dominates, and the result is like gossamer web, spun almost wholly from within; in the other there is a due proportion between the two factors, the one forming the warp, the other the woof of the closely woven fabric of science.

We sit at the feet of our good mother Nature to learn the solution of her riddles. The children of Aristotle, when she propounds a riddle, all too eager quickly cry out each, "I know, I know," and guessing guess wrong, or at least only half right. The children of Bacon, on the contrary, eagerly but patiently watch her face for a suggestion of the truth, catch up and ponder on every word which falls from her lips, ply her again and again with indirect questions, and thus by slow degrees gather, tease, almost extort from her, the truth. The one philosophy, more eager and ambitious, seeks to impose its own laws on Nature; the other, more humble and patient, is willing to accept such laws as Nature herself reveals. In the words of Bacon himself, the one is the eager "*anticipation of Nature*," the other the patient "*interpretation of Nature*."

We are apt to regard old philosophies and old theories as utterly *exploded*, annihilated, and new theories and philosophies as formed *ab initio* as it were by spontaneous generation in their place. But not so usually or even perhaps ever. As in the evolution of the organic kingdom some forms indeed become extinct, but many are transmuted into new and higher forms, and all the new forms are thus derived from the old, so in the evolution of thought some forms of thought indeed become extinct and leave no trace in the form of progeny, but others are transmuted into new and higher forms, and *all the new forms are thus derived from the old.* Thus Aristotle's method is not dead—will never die. In the evolution of the general theory of method it was transmuted into the higher form of Bacon's, but its spirit still lives, and the method is still used in the earlier attempts to explain all the problems of nature. Provisional hypotheses are always conceived in the spirit and constructed by the method of the Aristotelian induction, while the more perfect and permanent theories are conceived in the spirit and wrought out by the surer method of the Baconian induction. In many complex subjects such as sociology, psychology, etc., we are still largely under the dominion of Aristotle's method. Aristotle

must prepare the way for Bacon not only in the development of the general philosophy of scientific method, but also in the development of each separate department and even in the explanation of each separate problem in each department.

Thus, then, as in every case of a true law, we find the law of the whole epitomized in all the parts—the law of development of general scientific method epitomized in the development of each department of science, and of each problem in each department. The law is so deeply rooted in our mental nature that we find it also in the development of art and in the progress of society. But the law of social development must also be epitomized in the mental development of the individual, and we ought to find the same law here also. And so indeed we do. Here also we find successively dominant the two spirits and methods, the one in youth, the other in mature manhood. Here also we find first the mental factor triumphant, and then afterwards its due subordination to the natural factor. This is the order of evolution. It may be regulated and directed but may not be reversed by education.

We have now given the law and shown its universality. We have therefore covered the ground originally laid out. But there are at least two thoughts suggested by this discussion which press upon us for recognition.

I. *The Cause of Catastrophes, in Evolution by this Law.* The law given above is indeed a universal law of evolution of thought and therefore of all human progress, but fortunately progress does not require the conscious recognition of the law; otherwise there could be no progress at all, for recognition only takes place at a late, viz., the scientific, stage. As already stated, art precedes science—the empirical precedes the rational, the intuitive reason precedes the formal self-conscious reason. But progress is never assured, and especially is never steady and indefinitely continuous, until the law of progress is recognized and consciously applied by reason. This recognition of the law of progress, and the deliberate conscious working on that recognition and in accordance with the law—this advanced stage of progress is now reached only in science, because science is the simplest department of human thought. In science alone early attempts at explanation of complex phenomena are recognized as provisional,

as the conditions and agents of the subsequent formation of true and permanent theories, and therefore called "*working hypotheses.*" In science alone, therefore, progress is steady growth, without violent change, without revolution, without dangerous catastrophes. Even in science indeed there has sometimes been in early times somewhat of revolutionary change. Even in science the provisional character of its early attempts was sometimes unrecognized. The type of scientific evolution is indeed steady growth by alternate gathering of materials and reconstruction of theories—by alternate disintegration and redintegration on a higher plane—but even in science the very beauty and perfection of the provisional has sometimes proved a bar to progress. Good examples of this fact are to be found in the geocentric theory of the solar system and the Linnæan artificial system of botany. Just in proportion as such provisional explanations are elaborate and beautiful, just in proportion as they have lasted long and worked themselves into the habitual thoughts of scientists, just in that proportion is their overthrow resisted. And thus there arises often a period of transition, a critical period, a period of conflict between the old and the new. In science, however, such crises have never been dangerous to progress, and now that the function of working hypotheses is well recognized, can hardly be said even to exist. But in all other departments of thought, in politics, in ethics and in religion, the law may be said to be almost wholly unrecognized. In these the early embodiments of thought are not yet recognized as provisional, are not recognized as temporary agents and necessary conditions of progress, but on the contrary are either mistaken for the permanent, the final, the eternal, or else mistakenly regarded as unmixed error which must be destroyed utterly, not transmuted. Hence in these, change is resisted with passionate ardor, and progress can only take place by violence. Verily in these the kingdom of heaven must be taken, if taken at all, by violence.

History is a continuous series of illustrations of this sad truth. Society organizes itself on some basis—on some principle of classification—imperfect it may be, perhaps unnatural, or even to us absurd, but the best attainable at the time. Under its fostering influence humanity grows apace. Meanwhile the or-

ganized form *consolidates* into a more perfect and effective instrument of social activity, then *hardens*, then *petrifies*, and farther growth of humanity is rendered impossible. First the form is necessary, then helpful, then protective, then obstructive, then finally arrestive of growth, and must be broken and cast off. So also in theology: dogmas, and creeds, and confessions of faith are embodiments of religious thought absolutely necessary for religious activity; but dogmas and creeds inevitably *consolidate*, first into greater *effectiveness*, then harden into *protectiveness*, then petrify into *obstructiveness*.

Thus in all departments of thought except science, forms of thought, whether embodied as a theory, a creed, or a political organization, are at first in some sense natural and enthusiastic embodiments, necessary for life and helpful to growth, then gradually become hardened into a shell which is at first protective and conservative, but finally obstructive and arrestive, and must therefore be broken and cast off, if necessary, with violence. Such forms in their early stage are embodiments of living, active, *effective* truth; in their second stage are protective, conservative, perhaps *useful* dogmas; in their third stage are dead and therefore *hurtful* dogmas—are dead bodies from which we must pray to be delivered. Those who regard these forms only in their early effectiveness—in their living time—are apt to conclude that they are necessary to human progress, and that all the evils of the present are due to throwing them off. Those, on the contrary, who look only on the dead shell, imagine them the cause of unmixed evil only, both now and at all times. Only the philosophic thinker perceives their essentially provisional character as the agents and conditions of growth, but not the final form of perfect reason.

To illustrate: In all departments but science the growth and mode of activity of humanity may be compared to the growth and mode of activity of a *crustacean*. As a crustacean cannot walk without a shell, since this forms its skeleton, and therefore the basis and levers of its muscular activity, so we individually cannot get on or improve morally, cannot progress, walk, or be effectively active, without dogmas, formulæ, etc.; for they are the basis and levers of activity, the bones and skeleton and protective shell of moral and religious life. So also communities can-

not work together effectively without customs, rules, laws, etc., for they are *the basis and levers of communal activity—the bones and skeleton of society.* But as in the crustacean the shell, tho necessary for activity, is finally arrestive of growth, and must be broken and cast off and a new one formed so in society such customs, rules, laws, formulæ of whatever kind, tho necessary for activity, become finally arrestive of progress, and must, if they will not yield, be broken and cast off and new ones formed.

But when the law of evolution already explained is universally recognized not only in thought but also in practice, then the external form must ever quietly yield to the pressure of internal growth; then the structure, growth, and mode of activity of society may be compared to the structure, growth, and mode of activity, not of a shell-covered crustacean, but of a skin-covered mammal. As in these the bones, the skeleton, the basis and levers of action are *within*, and the external form is left to yield easily to the pressure of internal growth, so must it be with humanity under the rational régime, when self-conscious reason instead of blind and blundering empiricism shall guide the steps of progress. The skeleton, the basis and levers of individual and social activity, will be no longer in *external forms*, but in *internal principles.* The principles of action will no longer be without, but within, in the centre of our being, while external forms of all kinds, customs, laws, dogmas, are left in condition to yield quietly to the pressure of internal growth.

Again, to carry the comparison a step farther: As in the crustacean the external shell is not only obstructive but also *insensitive*, not only arrests growth but shuts out external impressions, while the transference of the skeleton within not only leaves the external in a condition to yield to internal growth, but also sensitive to external impressions; even so also in society, the rigid customs, laws, dogmas of early empirical stages not only arrest growth, but are impenetrable barriers to new impressions, while the transference of the principles of action within leaves the external form not only yielding to growth, but also sensitive to new experiences.

Thus finally the law which we first discovered in each special scientific question we have found also in each great department of science and in the general progress of thought. But since all

human activity is based on thought, we have found the same law in every department of human activity. But in science alone has human reason become so fully conscious of its own laws as to apply them with complete success. In science alone, therefore, do we find a steady, straightforward progress, like the measured tread of a grand army. In this steady march science has been and is still subduing the different departments of thought one after another. As each department comes under the domain of science, and falls into line, its previously vacillating and uncertain progress becomes a steady march. Thus the steady advance of science becomes the *pledge* and the *type* of all human progress—the pledge of its certainty and the type of its method.

II. *Comte's "Law of Three Stages."* We have seen that in the most perfect type of scientific development progress is steady and therefore without distinctly marked stages—the external form yields silently to the internal growth. But in most cases of complex questions, even in pure science, there are at least two well-marked stages, which I have called the *provisional* and the *permanent*, or the *empirical* and the *rational*. The passage from one of these to the other in pure science is normally peaceful, the construction proceeding *pari passu* with the destruction, the integration of the new with the disintegration of the old. But in the case of the more complex departments of ethical and political science, partly because of the greater complexity of the phenomena and therefore the uncertainty of the conclusions reached, partly because our feelings, passions, and dearest personal interests are involved in change, and partly because the forms of thought, sentiments, etc., have become hardened or even petrified into binding customs, habits, laws, dogmas, etc., which are difficult to break up—for all these reasons, the change from the one form or stage to the other is urged on the one hand and resisted on the other with equally passionate zeal. Thus there arises a more or less marked period of conflict—a transition or critical period between the two normal stages. And thus in all the highest and most complex departments of thought and activity there are *three* well-marked stages of progress, which may be called respectively the provisional or empirical stage, the

transitional or critical stage, and the permanent or rational or scientific stage.

Now these are evidently the same as the well-known three stages of the positive philosophy of Comte, which he calls the *theological*, the *metaphysical*, and the *positive* or scientific. But the adoption of the first two names was the result, on the one hand, of a prejudice against theology common to all the sensational school, and on the other an entire misconception of the nature of metaphysics, which he confounded with scholasticism. The names are therefore inappropriate and misleading. Comte confounds also method with subject-matter, and believed that not only what he miscalls the theological and metaphysical methods, but also theology and metaphysics themselves, must vanish and their domains be usurped by science. But in reality theology and metaphysics are just as fundamental and permanent domains of thought as science. Even Comte himself cannot get on without them, for while he *ex*plicitly rejects both metaphysics and theology, yet *im*plicitly his system contains a metaphysic, and ends in a theology, and even in a religion, a priesthood, and a form of worship. In reality, theology and metaphysics, as well as science, are eternal, but they also, as well as science, are subject to the three stages of progress traced above.

JOSEPH LECONTE.

THE KANTIAN CENTENNIAL.

IT is not easy to overestimate or to overstate the significance of the publication in 1781 of Kant's "Critique of Pure Reason." It is in no partisan or fanatical spirit that the student of philosophy and of human progress observes the centennial year of 1881 in commemoration of this event, by reviewing the significant changes in human thinking and human institutions—in philosophy and science, in literature and art, in ethics and theology—which may be properly referred to Kant and his great treatise. It is of comparatively little importance what interpretations we give to the leading positions of this memorable work, or what opinions we may hold of their truth or falsehood. We may hold that the conclusions of the author are uncertain or vacillating, that they are wholly or partly true or false, and yet we may most fervently and rationally believe that he rendered a service to philosophy, to culture, and to faith which should render him immortal.

This service may be described in a word. The "Critique of Pure Reason" raised questions for human speculation which could never afterwards remain unanswered. It proposed problems to philosophy which philosophy was compelled to attempt to solve. The "Critique of Pure Reason," if it accomplished nothing more, settled once for all the question that science, philosophy, experience, common-sense, and faith rest on certain fundamental principles which must in some way or other be justified to man's critical examination if he would justify his confidence in any form of knowledge. It may be said, and with a show of truth, that this position had been held by every great philosopher from Socrates down to Locke or Hume. And yet it had not been so inculcated as to be effectually wrought into the

convictions of all thinking men, until Kant made it so clear that no man who knows enough to know what philosophy is thinks of questioning that philosophy must meet these problems.

An interesting example of this truth is furnished in the experience of Mr. G. H. Lewes, the clearest thinker and the ablest expounder of a school originally and by tradition at the farthest remove from that of Kant. This writer began his studies in philosophy with the conviction that philosophy is a meaningless dream, and that this could be best demonstrated by its history. He ended, after a series of ineffectual struggles, with the concession that what he had rejected under the name of *metaphysics* not only could but must be accepted as *metempirics*, with this difference, which no man cares to deny, that *a priori* truths and relations must in some sense be justified by experience. The conversion of Mr. Lewes was slow, but it was sure. He could not face the problems which modern thinking finds in modern science without finding in them elements which are axiomatic and *a priori*. The late Mr. Whewell was in many respects an incompetent and unskilful expounder of Kant's philosophy, but his exposition, crude as it was, forced Mr. John Stuart Mill to attempt to solve the problem of induction by the *a posteriori* method. It would be impertinent here to express an opinion as to whether either failed or succeeded. All that we need to notice is the unquestioned fact that the riddle which both Mr. Whewell and Mr. Mill were forced to attempt to solve was propounded by the new Sphinx, which not long before had lifted its weird and mysterious form from out of the sand-wastes of Germany, under the formidable name of the Transcendental Philosophy. The rankest materialists of the present age, like Alexander Bain and his associates, acknowledge certain *a priori* elements in all scientific thinking, even tho they find them in those more complicated convolutions of the human brain, which have been hardened from the experiences of preceding generations; and Herbert Spencer, with a simplicity peculiar to himself, continues to explain by the relations of growth and organic development the most transcendental of the relations that had been recognized by Kant or evolved by the most imaginative of Kant's successors. Strangest of all, he imagined he could checkmate Hamilton and Mansel, two ardent philosophic

theists, by showing that the God whom they supplemented to philosophy by faith is demonstrated to be forever unknown and unknowable by the *a posteriori* discovery of the doctrine of the conservation of force. Mr. Spencer and Mr. Tyndall are confessedly not over-learned in the "Critique of Pure Reason," but the First Principles of the one and the eloquent philosophic apostrophes of the other give decisive evidence that the "Critique of Pure Reason" has forced philosophers of every school to ask and answer questions which were formerly either totally neglected or superficially solved.

The influence of Kant upon the Continent, it is almost superfluous to say, has been far more pervasive and permanent. We may think as we please in respect to the truth or falsehood, the reasonableness or the unreasonableness, of the three or four great schools which succeeded one another in Germany so rapidly, and each for the time occupied the attention of so many acute thinkers and eloquent expounders. But we cannot doubt that these discussions have deepened and quickened the thinking of three generations of able and learned men as no other movements have done in either ancient or modern times, and that the consequences both direct and indirect have been most valuable in the lectures and treatises with which they have enriched modern literature. We may think or speak lightly of German philosophy, if we choose, and in some respects perhaps with reason. We may wonder to see how rapid has been the growth, how wide-spread the influence, and how sudden the decay of one of its systems after another, after each had taken possession of a generation of youth and had controlled the theology, the jurisprudence, the politics, the literature, and the art of a quarter of a century. One thing we cannot deny, however, and that is the enormous "potential energy" which was hidden in the single treatise which a century ago was launched into being by this solitary thinker in a remote city lying on the borders of western civilization, from which he had never travelled more than some one or two hundred English miles. We find, however, that these systems as they have succeeded and in a certain sense displaced one another have been concerned with substantially the same questions which Kant propounded at the first, and are consequently connected with the "Critique of Pure Reason" by an

obvious course of development. We also find that within the last ten years there has been a spontaneous movement, affecting many minds, of return to Kant, which has been signalized by the production of scores of treatises in the way of statement and criticism, as tho all the errors into which recent philosophy had fallen might be more readily discovered by retracing the steps of all to their original starting-point in Kant, and corrected by a more exact or guarded interpretation of his original dicta. This revival of interest in Kant is something unexampled in the history of philosophy. Whether it has been wholly for good or not, one thing it most assuredly attests, and that is the ineffaceable impression made upon German and European thinking by Kant's greatest treatise.

Were we to illustrate the influence of Kant and his "Critique" upon modern thought we might take one of the old worn-out and barren heaths of Eastern Prussia, underneath which we should suppose there was a rich stratum of fertilizing material. It had long been tilled with shallow ploughing and superficial tending, till its scanty growth and monotonous and limited crops had become the disappointment and the mockery of both owners and spectators. A bolder operator drives the plough into the substratum beneath, and mingles its new and crude fertilizing richness with the sand that had before drawn upon its wealth in scanty measure. No sooner do the old and new begin to unite than a vigorous growth of weeds and flowers and wheat encumber the fields, to the dismay of the experimenter and the wonder of his neighbors. Plants new to the region spring into life. Flowers of oriental aspect flaunt their luxuriance and their gaudiness before the eye. But as one year follows another new growths surprise the beholder. By some the fields are thought to be bewitched and uncanny. By others they are regarded with doubtful favor, as the large and generous growth of substantial grain doubtfully contends with the wild luxuriance of weed and flower. Slowly and at last, however, the field clears itself of the strange misgrowths, till the addition to the substantial wealth of its before impoverished soil is acknowledged by all beholders.

The aptness and truth of this illustration will be justified if we recall to mind the fact that the "Système de la Nature"

of Von Holbach was published in 1770, eleven years before the "Critique of Pure Reason." Tho it was published surreptitiously and no man at first dared to own it, it in a certain sense represented the last word of the philosophy of its time. Tho Voltaire disowned it and Diderot in his better judgment rejected it, tho Rousseau denounced its conclusions with a violent protest of what he called his heart, there was nothing in the philosophy which had given law to the scientific world in the Encyclopædia or was giving tone to the literature of either Germany or France to justify or enforce any effectual protest against its atheistic materialism. On the other hand, whatever we may think of the truth or falsehood of the leading positions of the "Critique of Pure Reason," no man can doubt that it made philosophy speak words never uttered so clearly before. No one can question that the beliefs which it seeks to justify are solid realities, or that the problems which it proposes are necessary and fundamental to all earnest inquiry and to every solid philosophy. We may not accept all or any of its concessions. We may reject the most of its cautions as excessive or as tending to scepticism, but we cannot question that it proposes to defend the reasonable and necessary practical faiths of man in the soul and the universe, in God, in duty, and immortality in a rational and yet critical spirit. Its cautious and even its sceptical spirit is reverent, acknowledging certain truths to be sacred and necessary of which it fails to find a reason. That some of its positions tended to evil we cannot deny,—even to a scepticism as insidious, tho by no means so immoral, as that of Von Holbach,—but that its influence was in the comparison immeasurably more salutary, the history of European thought and feeling for the last century, especially in Germany, is a living testimony. We do not ascribe to Kant the chief, certainly not the exclusive, agency for the enormous and most salutary reaction in Germany which has taken place since the days of Voltaire and Frederick the Great, but we find in his philosophy a vigorous tonic which animated and reinforced the other forces that attended and followed it for the regeneration of Central Europe.

These general remarks may be more than sufficient to justify the homage which all right-minded and well-instructed students of

history will most cordially render to the great philosopher at the close of a century since the publication of his greatest work. Time, however, is the test of all human productions, and the "Critique of Pure Reason" has been subjected during this century to manifold and trying criticisms from foes and friends. The significance of this treatise has been specially manifested in the searching ordeal through which it has passed, and the spirited discussions which it has awakened. Those of us who desire to honor its author most effectually can do so by noticing a few of the criticisms and inquiries which have been suggested by the study of the work which a century ago he gave to the world with so many misgivings, and yet with so much confidence.

1. We notice, first of all, that the terminology of the work is needlessly artificial and abstract. Speculative men have often speculated concerning the practicability of a philosophical language, and have argued eloquently of the advantages which such a language would bring to the advancement and communication of knowledge. Their arguments would seem to find confirmation in the marvellous advantages which have accrued to many special sciences from a precise and systematic nomenclature. These advantages, however, have only been realized where the subject-matter is in a certain sense remote from common observation, and can be subjected to the rigorous test of sense experiments, aided by the refined appliances of art. When a few learned pundits are the only persons who are called to use a technical and artificial language with one another, and can speedily bring one another to the book by some decisive example or experiment, there need be no limit to the possibilities or the usefulness of a special scientific dialect. Neither of these conditions can be true of the sciences which relate to man's spiritual nature and their products, various as they are, whether they concern man's experiences or interests, his rights, his duties, or his hopes. For all these branches of knowledge there is a common and every-day dialect which with the many is very limited and very indefinite, and with the very few is variously extended and more or less exact. This dialect or terminology for this reason is capable of easy transitions and ready elasticity as each man attains to more or fewer of the new thoughts which the unusual but not wholly technical words express. Hence, every writer who would gain a

hearing and a welcome from his fellow-men for new thoughts in these departments of speculation or discovery is forced to be very sparing and cautious in the use of new terms. Whenever he requires his readers to learn a new terminology, whether for old thoughts or new, in the abstract regions of ethics, law, or psychology, he is certain to find few readers, for the simple reason that his readers distrust his capacity to teach them by reason of his manifest little confidence in their capacity to learn, or suspect his overweening confidence in his own wisdom in insisting upon his newly invented vocabulary.

It has not been easy, moreover, for Kant's critics to explain the history of his peculiar terminology by its history, to determine how far it was invented or devised for a purpose, and how far it grew up in his own mind in a half-unconscious way, as he brooded by himself, as every metaphysician must, over the problems which exercised his solitary thoughts for the twenty years in which the "Critique" was taking shape, if shape it might be called.

The names of Kant's favorite authors even have not been exactly determined, and the sources of many of his favorite terms in the meanings used by himself have not been satisfactorily ascertained. Whatever their source may have been, it is certain that some of his leading terms are not precisely defined by him either in the current language of common life or the more technical language of the schools. Moreover, his style, as not unusual with metaphysicians, is characteristically abstract, wiredrawn, and repetitious. For these reasons, and because the subject-matter was novel and in some cases startlingly paradoxical, this great treatise, with all its force and boldness, has always been felt to be many removes from the modes of thinking and of speech which are common to ordinary men. Its special terminology cannot easily be mastered. Those who were offended at the new philosophy would insist that it was not worth mastering. Those who rejected the new distinctions, as that between *the reason* and *the understanding*, would naturally reject the terminology which expressed them as barbarous and misleading.

Besides, and worse than all, it must be confessed that Kant was not always master of his own terminology, either because he was sometimes inconsistent with himself, or because he did not

always hold fast to his newly devised appellations. Moreover, aside from the defects of his special terminology, Kant was not a good writer, however clear and strong he was as a thinker. Tho at times he shows great power over language, and surprises you with the tenuity with which he draws out his fine distinctions of thought into delicate threads of speech, yet at other times he seems bewildered and lost in the mazes of both thought and speech, till the impatient reader longs for some short and sharp utterance which shall give in three lines the contents of a rambling page. The fact is unquestioned, that even among his numerous German interpreters, many able men put opposite constructions upon his opinions in respect to not a few of the most important topics. Of his English expounders and translators, only here and there one has ventured upon the effort of giving any other than the most literal *transferences* (rather than translations) of his words into barbarous English; very few have undertaken to expound the great principles of his system by the free use of the conceptions and terms which are current in English philosophy.

2. Leaving the difficulties of Kant's terminology and style, we are next embarrassed by the significance of the words *critique* and *the critical philosophy*—which are used by Kant in senses peculiar to himself. We find no special difficulty in understanding that they describe the attempt to discover the ultimate principles or elements of scientific and trustworthy knowledge, and are antagonistic on the one hand to the *scepticism* which distrusts and calls in question knowledge of every sort, and on the other to the *dogmatism* which assumes certain premises without reflection or justification. We can even understand that such principles must exist, if we could but discover and test them; but when we come to inquire what is the process by which to evolve them from their wrappings and justify them as universal and necessary, it is not so easy to answer our own questions. We naturally inquire, Is the "Critique of the Pure Reason" simply a psychological analysis of the functions of the intellect when separated from its auxiliaries of sense and imagination—the patient laborer and nimble servitor for the royal judge and imperial lawgiver known respectively as the Understanding and the Reason? If so, then it were better

had this been confessed at once, and had the effort of the writer been limited to a discriminating or analytic record of the steps by which the intellect finds these elements of its knowing everywhere present, and hence finds itself everywhere using them in the products or structures which it calls knowledge. We are embarrassed at finding that Kant nowhere takes this simple view of the critical process. He scarcely ventures upon any psychological analysis. He does indeed accept without discussion or justification the several intellectual faculties, as Sense, Understanding, and Reason, with only an incidental and later recognition of the Memory and the Imagination. His observations and his reasonings also very largely assume and rest upon the correctness of this classification of the faculties, and the assignment to each of its actual functions. On the other hand, the largest portion of the treatise is philosophical. Its arguments are confessedly distinguished as metaphysical and transcendental—the one involving an analysis of complex conceptions which are supposed to be understood in a definite sense by all men, and the other the trustworthiness and authority of certain sciences which are assumed to be as universally accepted. And yet Kant will not admit that the "Critique" is a system of metaphysics proper, but only a preliminary discussion of certain questions the right settlement of which was to determine the fate of all the metaphysical systems that should ever afterward follow. This want of clearness on the part of Kant in appreciating the nature of the critical process and its relation to Psychology on the one hand and to Philosophy on the other was noticed by some of the ablest of his earlier critics, notably by *Fries*, and it has been reiterated by later writers. Had this indefiniteness been avoided from the first, the clearness and convincing force of the treatise would have been greatly increased, the writer and his readers would have understood one another better from the first, and we hope it is not irreverent to say that the author would have better understood himself in his relations to current systems. Had he at one time been pressed hard by the psychological inquiry, Do the processes asserted comport with the testimony of consciousness and human experience? and at another by the metaphysical problem, Are the analyses and deductions truly made? he would have taken firmer and

surer steps in paths which he would thereby have made easier for others to follow. Certainly his English readers, who know little of metaphysics except as approached from the side of Pyschology, would have found less difficulty in understanding his meaning and in accepting many of his principles. It is pertinent to observe at this point that Locke's Essay is as truly and professedly a critical inquiry into the reach and authority of the human understanding as was Kant's "Critique of the Pure Reason." We can hardly say that it is much less philosophical or more psychological in its discussions. We should remember, however, in comparing the two, that the one treatise was published nearly a century before the other. It is not strange that the second should be more exact and profound than the first, and as a philosophical treatise should immeasurably surpass it. It is to be regretted, however, that in some respects at least it should lack the directness and naturalness both of its psychological method and its philosophical treatment.

3. We come next to one of the grandest features of Kant's "Critique;" viz., his demonstration of the presence of an *a priori* element in human knowledge—not in scientific knowledge only, but in knowledge of every kind. The problem itself is as old as philosophy. By few however, if by any, has it been conceived so distinctly and stated so forcibly as by Kant, in the elucidation of the question whether the mind can attain to synthetical propositions *a priori*, and, if so, under what conditions and by what authority. It was true this was none other than the old contrast so sharply but imaginatively made by Plato between αἴσθησις and επιστημη, i.e., sense knowledge and knowledge by ideas, and also by Aristotle between matter and form. Even Locke could not escape the recognition of it with all the earnestness with which he combats the doctrine of innate ideas, and refers all human acquisitions to his two sources of human experience; viz., the inner and outer sense, or sensation and reflection. It is only charitable to conclude that when Locke wrote in his second book of relations and in his fourth of the nature of knowledge, in both of which he unwittingly introduces a third *kind* and *source* of knowledge, he had forgotten what he had written perhaps ten years previously about the only two possible *sources* and *kinds* of the same, in the two forms of inner and outer experi-

ence. How the inconsistency of Locke can be explained is of little concern to us, so long as we find in his exposition of *relations* substantially Kant's doctrine of synthetical judgments *a priori*, given in connection with, but not on the ground of, our experience of material or spiritual phenomena. We find the same concession where the critic would least expect it to be made, and where the unconscious witness would be most unwilling to concede that he had made it at all; viz., in the exposition by Auguste Comte of the cardinal principle of the Positive Philosophy. This theory takes its name from its alleged survival and displacement of the metaphysical stage of thought with its *a priori* abstractions and its serene and solid contentment with the solid and positive facts of experience. The facts or phenomena which it recognizes as real and positive, however, are only material and sensible. And yet even Comte does not content himself with facts alone. Phenomena alone do not constitute science even in the theory of Comte, but *facts or phenomena as connected by the relations of succession and similarity*. What time and similarity are in the repertoire of the Positive scheme, Comte does not explain. He does not seem to suspect that it is all the same so far as the great question between him and Kant is concerned, whether there are *ten or twenty a priori* forms, categories, or ideas, or whatever they may be called, or whether there are only *two*, as he himself unconsciously admits and provides.

The signal service which Kant rendered in this discussion was that he settled beyond all controversy this long vexed and much disputed question, that knowledge is made up of two elements; viz., isolated facts and permanent principles, or phenomena on the one hand and relations on the other. If the one element comes by experience and in it the mind is a recipient and passive, the other comes by the mind's innate power and prerogative to know, in the exercise of which the mind is pre-eminently active and appeals to its own sovereign authority. When we say that he settled this question beyond all dissent, we certainly do not intend that no thinkers have entered a protest against his position in the form in which he asserted it, but that in some form or other all thinkers now admit it in fact. Even the grossest of materialists at present seem disposed to endow the ultimate atoms which they accept as *semina rerum* with

an original capacity to develop themselves under favoring circumstances into new forms of being and even into thinking agents. Moreover, when these atoms rise to the dignity of thinking agents, they not only begin themselves to geometrize, but they assume, by an enormously comprehensive synthetic judgment *a priori*, that the Eternal Force which animates the universe has geometrized from the beginning of the nebular accretions. If also we know him as Force, tho we know nothing more of him, we must know this at least *a priori*, that he is a causative agent and acts according to law, and law implies at least number and measure. If also there has been development and evolution from the beginning, then we are forced to interpret this all-pervasive and all-explaining relationship by a plan of progress vast enough to include every description of successive phenomena, and enduring enough to cover every step and stage of manifestation from the simplest to the most complex of events.

4. The strength and consistency of Kant's position in respect to the *a priori* element in knowledge as a *product* is strikingly contrasted with the weakness and vacillation of his views of the nature and authority of knowledge as *an act*. In analyzing human knowledge as a *product* without reference to the agent, he shows beyond question that it must imply *axioms* or *a priori truths*. In criticising the *power* in man by which this act is produced he concedes that much if not all which is thus assumed as true by him may not be real in fact. This results from the want of clearness which we have already noticed in his conception of the critical process, by which he at one time tries the product and at another confounds and blends the two. It is not surprising that the operator or analyst should fail in using the instrument the nature of which he fails fully to define.

One or two examples will illustrate our meaning. Kant distinguishes three several capacities and modes of knowledge: (1) Intuition in the two forms of the outer and inner sense; (2) Thought or judgment giving concepts or generalized attributes or relations; (3) The reason giving the ideas of the soul, the kosmos, and God. It is in the analysis of sense-perception that he conspicuously brings our confidence in the act of knowledge into suspicion and distrust. While he finds here two space and time relations as *a priori* elements, and proves them to be such

by the self-evident character of the pure mathematics, he concedes that they may be *a priori* to human beings only, and therein concedes that his *synthetic judgments a priori* may be true and necessary of man alone. They *may* be true universally, but we are not justified in asserting that they are. They are certainly transcendental to man—possibly to other beings, but whether they be so or not, we can neither affirm nor deny. This gives us a *transcendental idealism*—i.e., axiomatic or *a priori* truths for our human ways of knowing, or for the universe only *as known to us*, but not necessarily for the universe as existing in fact. What we desire and demand is a *transcendental realism* —a knowledge of those necessary principles which hold of the universe of fact or actual being. This can only be attained as we set off with the assumption that knowledge is the correlate or counterpart of being or reality. This Kant never either admits or asserts, but always fails to appreciate and propound.

It is not difficult to see how Kant committed this fatal error: at what point he shifted the switch which shunted a long train of consequences in a wrong direction. We find it at the very outset, where he contrasts the power of sense (both inner and outer) as receptivity or passive with the understanding as *spontaneity* or *an active energy*. What led Kant to assert for sensibility *passiveness only*, it is easy enough to see. The senses as such in their physiological or psycho-physiological nature are receptive, and change with the changing constitution of each individual animal. But the sense or perceptive power as such, so far as it involves the function of knowledge, is as truly active and spontaneous as is the act of the intellect upon any other object-matter. The objects as known with which it has to do are also as real and as trustworthy, so far as they are properly known, as are the objects of what are called its higher functions. That it falls into error, and frequently when it has to do with both, is a matter of every-day experience. This no man calls in question. The only question with which we are concerned is, whether the *a priori relations* which are assumed in sense knowledge are any the less real than the *a priori* relations which are assumed in the higher. That they are, was conceded by Kant in calling sense a receptivity only, in contrast with that spontaneity, which he limits to the higher functions.

The false position thus taken was weakened rather than strengthened by the expedient resorted to by Kant in order to defend and justify it. The receptivity thus assumed, so far as man is concerned, is obviously shut up forever within the flaming bounds of space and time. Whether the objects we know are objects of sense or experiences of the soul, we must know them as extended or enduring—one or both. This Kant was forward to assert, and here he finds the first example of a transcendental element in sense experience. How, then, could he connect this higher and necessary element with the passive receptivity from which he had apparently bargained away its prerogative to attain to any necessary or permanent truth? Fortunately for him, the shadows of a defunct philosophy had not all vanished, and he proceeds to endow this passive receptivity with *form*. *Form* here came to his aid—that magic term with which Aristotle had displaced the ideas of Plato, and which had served the Schoolmen many a turn in their metaphysical perplexities. So far as the mind is receptive in sense and consciousness, it has to do with the *matter* of human experience. So far as it is active it receives this matter in sundry *forms* that are universal. These forms are space and time—the one for the outer and the other for the inner sense. This magic term was no sooner suggested than it seemed whispered by some philosophic Egeria in the holy cave of musing contemplation. First of all, it squared with the conception of receptivity already assumed of sense as contrasted with thought. Next, if man is a recipient of the universe in sense, he cannot receive the whole of it at once—it must be divided into morsels and poured out into goblets; then, too, the viands must be served in order, and over against the infinitude and possible chaos without, there must be subjective capacities to receive after a particular fashion provided in the constitution of each recipient within. Then again, space and time relations are in their nature different from the commonly recognized attributes of matter and spirit, and refuse to be classed with those sensible qualities which presuppose them. Above all, Space and Time themselves are something ultimate, which are assumed in all special and determinate relations of place and shape, now and then. To all these requisitions the word *form* seemed admirably adjusted.

Justice to Kant requires us to notice that he does not fail to raise the question whether it follows, because space and time are the necessary forms of our human receptivity, that they have no objective reality? To this he frankly replies in the negative; but adds with equal frankness, that, inasmuch as they are necessarily *a priori* only to ourselves, we are utterly disqualified from deciding the question whether they are *a priori* to beings otherwise constituted. In other words, he leaves us with the conclusion that whether they are or not objectively real it is all the same to our perceptions and to our science, because we are forced to receive, i.e. to know, the phenomena of matter and of spirit under the relations of space and time, and to think and talk and reason as tho these relations are ultimate and *a priori*, and, so far as our knowledge is concerned, are objectively real. This establishes our confidence in science and philosophy by proving that in sense and consciousness the synthetic judgments of time and space are necessary and *a priori*—at least to man.

This sums up the doctrine of Kant in respect to the nature of sense knowledge, considered as a mere receptivity. We may speak of his views of consciousness in another connection. Our criticism of this theory may be summed up in a word. So far as sense perception is receptive and excludes spontaneity, it is not an act of knowledge at all, and cannot be at all concerned with space itself, but only with objects related in space. The convincing demonstrations of Kant, that space relations are apprehended in connection with sense experiences and yet are independent of the same in their self-evidence and authority, are founded on an analysis of the conceptions and processes of the pure mathematics, which confessedly have nothing to do with the act of sense knowledge when conceived as a passive receptivity. The suggestion of the possible idealism of space and time as the best explanation of their *a priori* necessity in human thinking, is a skilful expedient to make the best of a fatal and unnecessary concession. This fatal concession was an inadequate and mischievous conception of the nature of human knowledge. The concession was dictated by Kant's extreme caution in taking his positions, joined with his acceptance of some of the traditions of his time. The materialistic conceptions of the mental processes and their products which literally swarmed in

the pages of Hume were not easily exorcised, and the readiness with which in our time they have come again into the kneading-troughs of our magicians like the frogs and flies of the Egyptian plagues, under the guise of physiological and cerebral psychology, are the best explanation of the false conceptions which embarrassed the well-meant but unsuccessful struggles on the part of Kant to establish a better system. He would have cleared himself of all these embarrassments had he but clearly asserted that in knowledge man is always active, and that to knowledge reality is always a necessary correlated object, whether that object be a phenomenon or a relation.

5. Kant's distinction between *phenomena* and *noumena* is both vague and vacillating. It is neither clearly stated nor consistently maintained. The *phenomenon* is represented clearly enough as the temporary, the individual, and the contingent; and the *noumenon*, on the other hand, as the permanent, the universal, and the real. The one is the thing in itself, a permanent and abiding force or cause or agent, the other is a manifestation which is casual and conditioned. The one is discerned by the senses or consciousness, the other is interpreted by the mind. So long as these contrasted conceptions are popular they are intelligible. It is only when they are strictly scanned and carefully defined that we find a difficulty in fathoming or stating the meaning of Kant. We say very intelligibly of our relatively superficial knowledge of any material or spiritual object, as contrasted with a deeper insight into its nature and laws, that we know its appearances but not the *thing in itself*. We fancy, moreover, that the accomplished chemist or physiologist can somehow penetrate with magic look or touch into the real essence of a compound or a tissue or an organ; but we find on second thought that his knowledge is only more manifold or more recondite, better classified or better defined, than that of common insight and common speech. The deeper insight into the real essences of *things as they are* and not as they appear, which is attained by the most consummate specialist or the most accomplished scientist, is rather a promise to the ear than an attainment to the mind, if more is expected from either than a statement of a relatively greater number of effects which the agent can achieve under the greater variety of conditions under

which it occurs or of purposes to which it can be applied. So far as the world of sense is concerned, it may be true that we cannot know things in themselves, that we are limited to phenomena alone, and that human science can go no further than multiply its observations, add to its inductions, and make its definitions more precise, comprehensive, and systematic. But should we concede all this of material things *in themselves*, it does not therefore follow that more is not true of the mind's knowledge of itself. Let it be granted that sense knowledge gives us the phenomena only at which we gaze as they fly, that these are formed into things as the masses of vapor are held in form and place and color by the great forces that penetrate and mould them into mountains and glaciers and pasture-lands and forests and rocks, till in an instant they vanish into smoke. Let this be granted, and still it may be none the less true that the thinking agent is known to and by itself as a *thing in itself*, i.e., a potent and permanent and identical reality, and indeed that it must be so known in order that the contrast should even be suspected by the mind between a thing in itself and its manifestations or phenomena. All this Kant overlooked, and in overlooking it in effect denied. As in the sense-world he found phenomena only, so in the spirit-world he recognized only ideas, or rather by recognizing only phenomena in either he reduced the world of both matter and spirit to the ideas appropriate to each. Starting with the laudable purpose to emerge from the shadowy world of impressions and ideas into which the scepticism of Hume had brought him, he succeeded so far as to find it necessary for the purposes of science to connect these phenomena by *a priori* forms and categories and ideas. He found, however, that even if the relations which connected phenomena were real and necessary, the materials were shadowy still, and that consequently the universe of matter and spirit must be resolved into a system of related ideas or phenomena given in what we call sense and consciousness. Things and realities were nowhere at the end because they were denied at the beginning. The conjuror had undertaken to draw out of his pocket more than he had put into it, i.e., to evolve realities from ideas by metaphysical jugglery. He thought by the force of necessary and *a priori* relations to make a real universe of matter and spirit out of the

phenomena of each, not reflecting that however authoritative and permanent may be the relations of time and space and causation, and even of design, if the agents or forces which they connect and explain are not real, then the conclusions to which they lead, and the combinations into which they enter, must be as shadowy as the data from which they are derived and the materials of which they are composed.

It is worthy of special notice that Kant seems specially sensitive in his hostility to every argument that might be urged in favor of the reality and knowableness of *spirit* as a thing in itself. It would seem as tho at times he was more than suspicious that here was the weakest side of his entire theory. Again and again he denies that the soul has any other unity than that unity of apperception by which many sensations are connected in a one so-called material thing; there is no proper continuity of being known to and by itself, but only an uninterrupted flow or succession of phenomena; no substantiality, because the concept of substance can be affirmed only of the subjects of sense in space or picturable phenomena; no permanence or immortality, because these could belong only to substantial, i.e. material, things. In other words, the Ego in all these contrasts is reduced to a psychological expression, as insignificant and contemptuous as had been done before him by Hume or in our days by Mr. Huxley. We find also the distinct denial of the capacity of the soul for self-consciousness of its own states or of itself; indeed, for anything more than the "thread of consciousness" or the unity of apperception by which successive mental states are connected as one.

Over against these jealous and violent efforts of Kant to deny the knowableness of the soul as an agent with a definite nature of its own, we would set the whole argument of the "Critique" from beginning to end so far as it defends and expounds transcendental idealism. We contend that its doctrine of the forms of sense and of the categories of the understanding and the ideas of the reason are from beginning to end a series of psychological conclusions or assumptions in respect to the nature of the soul *as a thing in itself.* They not only imply and assert that the soul has an essential nature, but that this essential nature is knowable by man. They not only in fact but by

profession penetrate beneath its phenomena, and find there a nature or constitution capable of moulding the universe of sense and matter by subjective forms, categories, and ideas. They propose to show that all the knowledge which man can attain is only phenomenal, and this by an analysis into the nature of the soul itself. They find beneath the forms, the categories, and the ideas the soul with a nature which compels it to mould and connect and systematize and interpret the phenomena of the inner and outer universe by the relations and into the products which its own constitution requires. This is the logic of the entire treatise, the height of whose great argument would have been reached had Kant climbed with careful steps to its summit, and reviewed its result somewhat as follows: The pure reason is an agent known to and by itself as so constituted, or of such a nature that it discerns the phenomena which it is capable of receiving, under those relations by which it necessarily connects and explains them. So far as the soul can critically examine and study these experiences—so far does it penetrate into its own nature as an agent or thing in itself. Philosophically conceived, a thing in itself—whether it be matter or spirit—is known and is knowable so far as its powers to act or achieve effects under varying conditions are known. The effects achieved, as distinguished from the agents which produce them, are phenomena. The One Mind that originated and sustains the universe of things alone knows all the capacities of any of the agents which he creates, and he alone fully knows the nature of the simplest as well as the most complex, as it is in itself. Surely Kant ought to have conceded that if nothing else is known to man *as a thing in itself*, or a *noumenon*, this is true of the reason itself as revealed to itself by the critical process.

As we have seen, our philosopher reached no such conclusion, but wandered in endless mazes till he often seems bewildered and lost. But whatever else he loses he never loses courage. In his extremest bewilderment he ever and anon catches up his clue and threads his way backward and forward till he seems to strike his path afresh and go forward with unabated courage. But he never could overcome the fatal inconsistency involved in the attempt to analyze the essential nature of the

pure reason in the abstract, in order to show that it has no nature in the concrete which can be analyzed.

Did our space allow, we might show that the reality of *matter* and its knowableness by man as a thing in itself is also perpetually assumed by Kant whenever he refers to the universe as phenomenal only. If the senses are receptive, they suppose reality in the matter which acts upon them. The receptivity of the senses supposes an agent which lies beyond and without, from the causative energy of which the recipient can never escape. To say that we are not sensitive to all the capacities of these agents, is to confess that we are finite. If we must know any of them *completely* in order that we may know anything at all, then we can know nothing of any thing, whether material or spiritual. The result of such experiments might teach us that it were wiser to dig for the pot of gold that lies under our own feet and be content with what we find, rather than to chase round the earth till we lay hold of the end of a rainbow.

It might be contended that Kant's theory of knowledge, whether of mind or matter, is not complete till the action of the understanding is superadded with its categories, and of the reason with its ideas. This in one sense is true. So far, however, as the points are concerned which we have introduced, we need go no farther. He does not profess that the understanding and reason can bring deliverance from the circle of limitation and helplessness within which he had shut himself by the concessions to which we have referred. That circle shuts us off forever from the knowledge of things as they are. The phenomena of matter and spirit are all preserved. Science pure and applied is provided for in its axioms and methods. Man believes and reasons as if his soul, the universe, and God were realities. But reality is beyond man's reach, for all that he knows is phenomenal, and things in themselves or their essential nature he cannot know. To this condition of conscious strength and confessed weakness did Kant's "Critique of the Pure Reason" bring him and his disciples.

It is no paradox to say that both the weakness and the strength of the critical school lifted it to a position immeasurably superior to that of the shallow sensualism and the dogmatic scepticism which it had effectually displaced. The pre-

tensions of mere experience and the authority of so-called facts it had silenced forever by demonstrating that either or both without relations and principles were insignificant and worthless. The sceptical caution which refused to affirm *a priori* relations of any other than the human reason was in its turn a rebuke to the dogmatism which had hitherto been regnant in the schools. Both introduced a new spirit and method into modern speculation, and emphatically taught the new generation that there were more things in heaven and earth than had been dreamed of in its traditional philosophy.

6. We notice next the profoundly ethical spirit of Kant's philosophy. It is a commonplace to say that what Kant failed to reach in the domain of the pure reason—rather what he demonstrated could not be reached—he believed was fully attainable through the practical or moral reason. What he blindly clutched at in the dim and uncertain light of intellectual speculation, he imagined he could firmly and strongly grasp under the broad noonday of the moral convictions. These convictions he assumed to be as real as the indisputable and axiomatic certainties of the pure mathematics. Much after the same fashion as he found that geometry and number implied the assumptions of space and time, did he reason that the intuitions of duty implied the actual validity of the ideas of the soul, of immortality, and of God. If this were so, then the mind is no longer limited to the relatively *a priori*, with which it is forced to content itself, as the utmost to which it can attain. Through the practical reason, nay, at its command, it can lay hold of *things in themselves*. It confidently fastens itself to the actual first and supreme, because it commands itself to accept those verities which it must believe in order that it may command itself to be and do what it knows it ought to attain. In using the categorical imperative man knows himself to be free. In asserting that he is free he pierces through the shell of phenomena and reaches *the thing in itself* that lies beneath; viz., the soul's own veritable existence. In asserting the actual existence of man we imply the necessary conditions of his moral life and destiny. These give reality to the world of matter, to the immortality of the responsible soul, and the moral providence and retribution of God. So long as we rest in the intellectual sphere, all is dim and uncer-

tain. We are in a world of shadows—a world orderly, systematic, and rationalized indeed, but still necessarily uncertain and phenomenal. But the instant we emerge into the ethical these shadows are crystallized into realities. What was a weird and ghostly structure is transfigured into a temple built without hands, eternal in the heavens.

Whatever we may think of the soundness of this theory, we cannot but admire its boldness and its elevation. However fervently we may protest against the gratuitousness of the concessions by which the battle seemed so near to being irrecoverably lost, we cannot but admire the boldness of the movement by which it seemed to be more than recovered. The effect of these positions upon the subsequent course of modern speculation has been most salutary. Ethical relations were henceforward exalted to a supreme place in philosophic thought. Freedom, duty, immortality, and God were not only recognized as subjects of the highest dignity in speculative schools, but it has been more than acknowledged that any system which did not recognize these conceptions and relations, and explain the phenomena which they involve, must be superficial and defective. So soon as the school of Kant was established, the frivolous and insincere dogmas and critiques of savans, the sensual orgies of the voluptuaries of the *salon*, and the sentimental declamations of the school of nature, were by common consent set aside and displaced by the grand and commanding relations which the categorical imperative introduced and enforced.

It was impossible that modern thought should ever go back from the point to which it was carried forward by the uplifting and surging force of Kant's eloquent and impressive utterances in respect to man's moral convictions and emotions. We believe, indeed, that the moral dignity and strength of Kant's system have been the principal sources of its enduring popularity. Multitudes who could understand little and who cared less about the speculative questions which he raised, and who were ready to find in their own incapacity to follow his analyses a decisive argument that all purely speculative inquiries are incapable of any solution by the human understanding, have been ready to assent to the comparatively easy analyses of his critique of the practical reason and his positive assurances that these must settle

every question of speculative import. It was as an ethical system that Kant's teachings first found introduction to the English mind through Coleridge, Carlyle, and others. The so-called agnosticism that came in afterwards was originally taught by Hamilton and Mansel, in the ethical spirit of Kant and with the ethical adjuncts with which he fortified his speculative system. It ought not to be surprising that when it lost these adjuncts it experienced a sad degeneracy. When freedom was sacrificed to the remorseless dominion of natural law, and responsibility and self-command were resolved into physiological outgrowths, and the moral law itself was sublimated into a fiction which society makes and unmakes at its will, it is not surprising that the noblest speculative conceptions of Kant should be travestied into cheap imitations under hallowed names, and the Unknown and Unknowable of the speculative reason should be boldly interpreted by a Material Force, and reason itself, both practical and speculative, should be resolved into highly convoluted and intensely specialized masses of nervous matter.

But while we assert for Kant's ethical system an unquestioned dignity and practical importance, we do not thereby accept it as true. First of all, we do not accept, for the reasons already given, his theory of the limitations and impotence of the speculative reason which in any sense should demand such a buttress and supplement as his practical reason furnishes. We do not see why, if the self-conscious spirit should be able in the special experiences of moral freedom to discern the real as contrasted with the phenomenal Ego, it should not be able to discern the same in the ordinary activities of the man. We grant that in the ethical activities and judgments its existence and activity may seem more energetic and positive, but not necessarily more real or trustworthy. Again, we cannot accept the reasoning that the free, substantial, and therefore the possibly immortal Ego must be assumed or morality is impossible, when the very question of questions nowadays has been inverted into, "*Is* man free, and therefore is morality possible?" We do indeed allow the test of practical consequences oftentimes to decide the question of truth. But this signifies only that the actual convictions of men are best ascertained when tried by practical rather than speculative tests, and ethical convictions are pre-eminently positive and certain.

Nor, again, for an instant, can we accept the doctrine of the categorical as contrasted with the hypothetical imperative, which Kant's system has made so familiar. We assent most heartily to the emphatic utterances with which he asserts the reality of freedom and personality and obligation; but we cannot, for this reason, believe that the law of duty is not derived from the known nature of man and imposed on man by himself in view of its discerned excellence and worth, and is in this not blindly, i.e. categorically, commanded, but in view of the excellence of the activities and results which its realization involves. If the last is true, it is hypothetically commanded in terms like these: If you would fulfil the high ends for which you exist, and take the place in the universe for which you are fitted, you will choose so-and-so. Such a choice is morally right. Therefore, it is your duty to make this choice in view of the excellence of which your intellect is a competent judge. This view of the imperative of duty makes it no ultimate category of either belief or action, but assigns it a place under that of *purpose or design*. It connects the practical and speculative reason by this one relation common to both. The view of Kant severs them by an impassable chasm which Kant's frankness seems more ready to suspect than his ingenuity is competent to bridge over or fill. Last of all, the rejection of all relationship between the natural and ethical sensibilities and conceptions in order that the last may be kept pure from all empirical content or considerations of happiness or well-being is open to the most serious speculative and practical objections. Schiller felt and acknowledged it, even in the fervent glow of his first conversion to the stoical severity and lofty idealism of the Kantian ethics. The well-known lines have often been quoted which express the speculative and practical dilemma which the theory involves. A difficulty is proposed—

> "Willing serve I my friends all, but do it, alas! with affection;
> And so gnaws me my heart, that I am not virtuous yet."

It is answered thus:

> "Help, then, but this there is none: you must strive with might to contemn them,
> And with horror perform, then, what the law may enjoin."

The objection urged by Kant against any system that founds moral relations on the relative excellence of the natural sensibilities, when brought under voluntary control, that it is Eudæmonistic and necessarily *un*moral, is answered against Kant himself by the well-known fact that he rests his argument for the reality of God's existence and his moral dominion altogether on the eternal fitness enforced, as he claims, by the categorical imperative, that the morally good should be made sensitively happy. If this is true, then it must be assumed that virtue should be rewarded by happiness; or, to express the truth in abstract terminology, there is an eternal and *a priori* relationship between virtue and happiness. The only possible escape from a palpable contradiction of thought in this argument can be reached by taking the position that, tho there is an eternal and *a priori* and self-evident necessity that the virtuous should be made happy, yet if they act under the knowledge of this fact they will cease to be virtuous. In other words, while it is absolutely necessary that God should exist in order that the virtuous should be made happy, it is equally necessary that they should not know this necessary truth, or at least not be influenced by their knowledge of it, in order that their acts should be virtuous.

It would be quite out of place, however, to attempt any extended criticism of Kant's ethical system. Schleiermacher, Trendelenburg, Lotze, and Bona Meyer, and others have recognized and exposed its weak points. Its practical excellencies and the services which it rendered are most emphatically confessed by those who are most alive to its defects.

7. It remains that we should notice the influence of Kant upon theology. That his immediate influence should have been disturbing was most natural. A system so positive, so peremptory, and so highly technical could not but exert a positive effect upon the current modes of thinking and writing in respect to the fundamental truths of theological speculation. Its novel and highly technical dialect would seem to express new ideas whether with or without reason. But whatever novelty of ideas or terminology might have invaded theological circles as a consequence of the teachings of Kant, and however puzzled the old theologians might have been by the Babylonish dialect of the

new, theology itself was recognized by him as the haven of all man's contemplations and the mistress of all human sciences. The Kantian metaphysics and ethics were both emphatically and confessedly theological. God was assumed as in some sense an ethical, if not a speculative, necessity to all human thinking, and the destiny of the soul, if not its future existence, was held to require and to rest upon faith in God. Indeed, we may say with confidence that one of the most memorable services rendered to modern thinking by Kant's essay was its introduction of God as a necessary element and axiom to all subsequent thinking that should claim to be called philosophical. In 1771 the "Système de la Nature" was supposed to have finally and effectually banished the idea of God from all philosophical schools as an explodod figment of the human imagination. In 1781 the "Critique of Pure Reason" demonstrated that it is not possible even to think of the universe rationally and systematically without the assumption of a thinking God. Such a God must consequently be a personal being who could accept personal worship and affection, and could make himself known to man by personal manifestations. Whatever vagueness or uncertainty might be suggested or implied on the speculative side in respect to the knowableness of God, or man's capacity to define or formulate his conceptions of God, these difficulties were all set aside by the demands and capacities of man's ethical nature. The beginnings of our modern agnosticism were doubtless suggested in Kant's antinomies, and his misgivings as to any possible adjustment of the categories of the understanding with the ideas of the speculative reason; but these difficulties were thought to have given way to the overbearing demands of the practical reason. So long as man knows himself to be free and commands himself to reverence the law of duty, and so long, also, as he requires that virtue shall be rewarded and vice shall be punished, so long is it not only possible, but necessary, that God shall be believed in as himself personal and free. Theology, then, as distinguished from religion, as it rests on an ethical sanction, can be tested by its ethical import, and this whether it is natural or revealed. So far as it has a moral content, it may be accepted as true. So far as it is immoral, i. e., in so far as it fails to commend itself to the practical reason, by which all religion

stands, so far is it known to be false. Positive or revealed religion, however, must also be morally necessary. Such necessity Kant recognized in the sinfulness of man, which he conceived as a permanent and universal supremacy of desire or passion over the practical reason, furnishing an obvious occasion for the interposition of supernatural influences in the economy of grace.

But while Kant found a place for all the fundamental conceptions and many of the special teachings of Protestant orthodoxy, it must be confessed that he placed chief emphasis upon the moral rather than the supernatural—upon the ethical import rather than the historical or supernatural facts of the Christian system. For this the theologians of his time are largely responsible. With scanty exceptions, the Protestantism of his day had become a system of dead orthodoxy and political ritualism, in which facts, dogmas, and worship had become largely emptied of all their quickening ethical significance, and had lost much of their spiritual meaning and power for the conscience and the heart. The feeble religious life that survived, and was slumbering in the embers that had survived those fiery controversies in the schools and on the field that succeeded the Reformation, had little or no intellectual or scientific significance.

It is very common to charge what is called modern rationalism upon the rise of the critical philosophy, and to denounce it under the vague designation of transcendentalism. It were altogether more exact and rational to find in the teachings of Kant the germs and explanation of a powerful religious movement in two opposite directions, one positive and the other negative.

We have briefly explained the definite recognition of the ethical which we find in Kant's own system, leading to a positive faith in the supernatural, as also the importance with which this was invested by him as a source of natural and a recipient or medium of supernatural knowledge. By many of his successors, notably by Jacobi and Schleiermacher, *Faith*, more carefully phrased as the *Sense of dependence* or the *God Consciousness*, was definitely substituted for the practical reason and made to do duty as an organ of speculative, ethical, and theological truth. In England Coleridge, Hamilton, and Mansel were more properly disciples of Jacobi than of Kant, and it is through these representatives that the first type of transcendental supernaturalism be-

came familiar to the English mind. The influence of the theological school that thus originated among English-speaking people has been profound and pervasive, and its existence and strength is a convincing refutation of the charge against the Kantian philosophy as necessarily anti-supernatural. It is neither false nor extravagant to say that many of the ablest expounders and defenders of supernatural Christianity during the last two or three generations upon English and American soil have been of the so-called transcendental school.

It is equally undeniable that we find in Kant's teachings the germs of three schools of anti-Christian or anti-supernatural theology, viz., the naturalistic, the pantheistic, and the agnostic schools, all having this feature in common, that they reject the miraculous as either unnecessary or impossible and therefore as historically incredible or false.

The *Naturalistic* or Rationalistic school is represented by all those who hold, inasmuch as the leading truths of morality and religion must justify themselves to the practical reason of man, that therefore they cannot be made the matter of supernatural revelation, or do not need to be so enforced. The dilemma into which they seek to drive their antagonists is the following: Man can or cannot know all essential moral or religious truth without the instruction or aid of supernatural communications. If he can, there is no need of such a revelation. For why should that truth be revealed which is or may be known already? A supernatural revelation in such a case is superfluous. If he cannot know these truths, then such a revelation is impossible, for the ideas and truths which man cannot understand by their own light or be convinced of by their own evidence can neither be made intelligible by any extraneous explanation or credible by any external proof. A supernatural revelation is therefore impossible. It follows that a supernatural revelation is either superfluous or impossible. This argument is the staple or current argument with many well-known English writers, who are more or less emphatic and conspicuous in avowing their adhesion to Kant's ethical system. Such are Theodore Parker, Francis W. Newman, Frances Power Cobbe, James Anthony Froude, and Thomas Carlyle. How Kant provided against this application of his own theory we have already explained. Other reasons,

indeed, are urged by these writers to enforce their rejection of an historical and miraculous revelation. But this position is common to them all.

The *Pantheistic* school is only indirectly related to Kant. Historically it can be traced to him through his doctrine of the impotence of the pure reason to define or justify man's belief in the Infinite. While he professes to overcome this impotence by means of the practical reason, and so escapes the immediate pressure of the difficulty which he acknowledges, he leaves all its difficulties to those who do not accept the relief which he provides. There are not a few who not only fail to find this sharp contrast between the pure and practical reason, but to whom the contrast itself is positively offensive, and to whom the difficulty of accepting the proffered solution of the problem only enhances their sense of its inherent difficulties. To such the conception of an organism with the interdependence and interaction of its constituent parts with one another and the whole as mutually means and ends, presents the most satisfactory solution of the existent universe and its orderly arrangements. That the universe is a self-existent organism in which matter and spirit are mutually dependent for being and function, is to many the most rational explanation of all finite existences and finite phenomena. The pantheistic doctrine and the pantheistic school is only indirectly derived from Kant. His many-sided and enlarged understanding was the first to do ample justice to the conception of an organism and the organic—conceptions which since his time have played so distinguished a rôle in the sciences of nature, and pre-eminently in the sciences of life. Schelling, with quite as much of a poet's quickness to suggest analogies as of a philosopher's solidity in critically judging them, used the fact of the organic interdependence of the finite viewed from within as equivalent to its complete independence on any Self existent from without, in a manner which Kant had been too cautious to sanction by example or authority. The consequence was, that upon the sober background of man's demonstrated incapacity to formulate the self-existent, Schelling did not hesitate to portray in brilliant diagrams the successive stages of the process by which the self-existent universe developed itself into beauty and life. Spinoza, in place of Kant, became the hero of

the hour—the chief relation of both Schelling and Spinoza to Kant consisting in the fact that they confidently answered the many questions which Kant had the sagacity to propound, but professed to be unable to answer. Hegel followed Schelling! —but it is not within our province to indicate through what phases of thought Schelling and Hegel sought to solve the problems which Kant proposed in respect either to Theism and Christianity, or in regard to man's power to know.

The *Agnostic* school, technically so called, interprets the Kantian position that man cannot formulate the Infinite by the relations of the logical understanding as equivalent to the assertion that he cannot know God by the intellect at all, and proceeds to supplement the same by the analogies suggested by the doctrine of the correlation of force to the conclusion that tho we can know *that* God is, we cannot know *what* he is; thus philosophically demonstrating that God cannot be known by man either by the axioms of intuition, the interpretations of nature, or the revelations of miracle. Moreover, inasmuch as the great law of evolution must be accepted as holding true of all growths whatever, of phenomena and of being alike, of the categories as well as the objects of knowledge, of man's conceptions of things earthly as truly as of his faiths in things divine, it follows that the concessions of Kant concerning the intellectual unknowableness of God have, in the light of the evolutionary metaphysics, become as solid as any truth can be made by a system which rests axioms and experiments alike upon a formula that subjects all knowledge to uncertainty and change. It requires but little knowledge of Kant to justify the assertion, that the logical connection of the materialistic agnosticism of Spencer with the intellectual caution and moral fervor of the philosopher of Königsberg is slender in the extreme, while the moral unlikeness of the two theories is as great as can easily be conceived.

Nothing more strikingly illustrates the intellectual and moral greatness of the sage whose centennial year we observe, than the depth and breadth of the problems which he proposed and the sagacity with which he measured the difficulties which must beset their solution.

We ought not to be surprised that the countrymen and stu-

dents of Kant have of late turned to the study of his writings with a quickened interest. Their interest is more than a critical curiosity into the import of his terminology and the interpretation of his sentences. As we have already stated, we find the explanation and the justification of this revived interest in Kant in the clearness and comprehensiveness with which he appreciated the great problems of philosophical inquiry and the acuteness with which he states and answers the questions which must be forever renewed by man, and above all in the thorough and honest love of truth by which he was animated. It is to the credit of the present generation that it does not despair of philosophy, and that for this reason Immanuel Kant finds more readers in Germany, France, and England—to say nothing of America—to-day than when, a century ago, he summoned all Europe to hear the interpretations of the new philosophy, and all Europe responded to his call.

NOAH PORTER.